USER MANUAL

SAILOR®

SAILOR 700 VSAT

Thrane & Thrane

SAILOR 700 VSAT

mini-VSAT Broadband[sm] System

User Manual

This User Manual provides all of the basic information you need to operate, set up, and troubleshoot the SAILOR 700 VSAT system. For detailed installation information, please refer to the *SAILOR 700 VSAT Installation Manual*.

Serial Numbers

ADU

ACU

VMU

IP Handset

The ADU (antenna excl. radome), ACU (Antenna Control Unit) and VMU (VSAT Modem Unit) are supplied by KVH Industries as OEM products (TracPhone V7 antenna, TracPhone V7 Control Unit and TracPhone V7 Modem).
The IP Handset and the radome are manufactured by Thrane & Thrane.

Thrane & Thrane Part # 98-128893-D, KVH part # 54-0630-D
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CE Declaration of Conformity

KVH Industries, Inc. located at 50 Enterprise Center Middletown, RI 02842-5279 U.S.A. declares under our sole responsibility that the following products are in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC):

02-1563 TracPhone V7 Antenna
02-1601 TracPhone V7 Antenna Control Unit
19-0487 TracPhone V7 Modem

Equipment applicability

The TracPhone V7 is a system that provides broadband internet connectivity between a ship and any destination in the world. The equipment is not intended for SOLAS applications.

Declaration and Certification

The products are compliant with the following standards:

Essential Requirement		Applied Standard(s)
Article 3.1(a)	Health & Safety	EN60950-1:2001
Article 3.1(b)	EMC	EN 301 843-1 v1.2.1:2004-06, EN 301 843-6 V1.1.1:2006-01, EN61000-3-2:2000, EN61000-3-3:1995, EN60945:2002
Article 3.2	Spectrum Efficiency	EN302 340 V1.1.1:2006-04

The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of Notified Body Identification Number: 1000

CE 1000

Rick Jones, Director of Corporate Quality

8 Apr 09

Date

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1. Introduction

This chapter provides a basic overview of this manual and your SAILOR 700 VSAT system. It also provides important safety information you need to know before using the product.

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Using this Manual

This manual provides complete operation, configuration, and troubleshooting information for your SAILOR 700 VSAT system.

Who Should Use this Manual

The **user** should refer to the "Operation" chapter to learn how to operate the system.

The **user** or **installer** should refer to the "Configuration" chapter for information on setting up the system for the desired preferences.

The **user** and/or **servicing technician** should refer to the "Troubleshooting" chapter to help identify the cause of a system problem.

Icons Used in this Manual

This manual uses the following icons:

Icon	Description
	This is a danger, warning, or caution notice. Be sure to read these carefully to avoid injury!

Icon
Description
This is an illustration of the buttons on the ACU. Gray shading indicates which button the user should press.

Typographical Conventions

This manual uses the following typographical conventions:

Text Example	Description
Press ▼MENUS to view the menu	Both the icon and the name of the button are provided
SELECT SATELLITES	Text as it appears on the ACU display
The display shows “BRIGHTNESS”	Text in quotes is shown on the ACU display
See ***“Switching Satellites” on page 14***.	Cross-reference to another chapter in the manual or to a website

Related Documentation

In addition to this User Manual, the following documents are provided with your SAILOR 700 VSAT system:

Document	Description
Installation Manual	Complete installation instructions
Service Activation Form	Details on activating the system for mini-VSAT Broadband service
ADU Mounting Template	Template that the installer uses to lay out the ADU mounting holes
Contents List	List of every part contained in the delivery

Important Safety Information

For your own safety, and for the safety of your passengers and/or crew, be sure to read the following important notices.

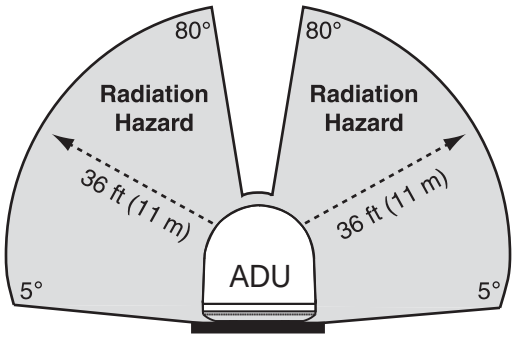
Warning - Risk of Electric Shock

Potentially lethal voltages are present within the ACU and the VMU. To avoid electric shock, do not open the chassis enclosures of the belowdecks equipment. They contain no user-serviceable parts, and opening the enclosure(s) will void the product's warranty.

Caution - RF Radiation Hazard

The ADU transmits radio frequency (RF) energy that is potentially harmful. Whenever the system is powered on, make sure everyone stays more than 36 feet (11 m) away from the ADU within its 5°-80° elevation range. No hazard exists directly above the ADU and anywhere below the ADU's mounting plane.

Figure 1-1 Minimum Safe Distance to Avoid Risk of RF Radiation Exposure



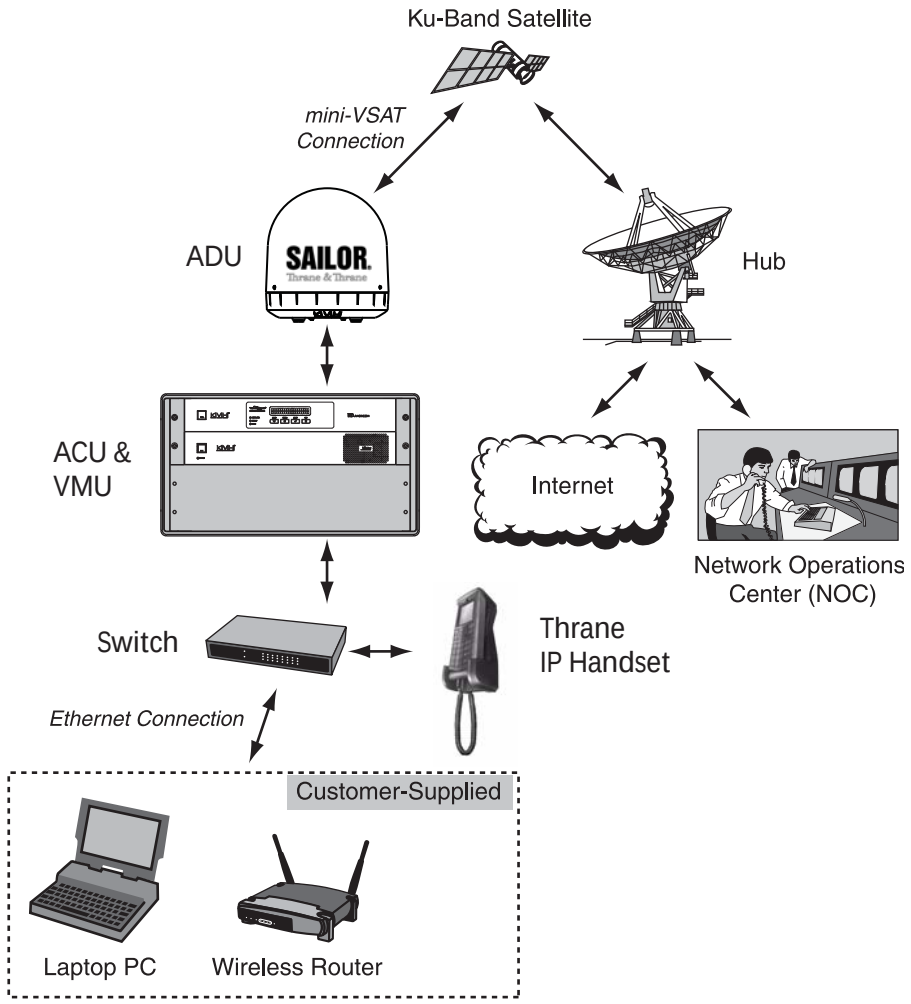
- If a person is standing outside the ADU's main transmission beam, minimum safe distance is 1 foot (0.3 m). However, since a person may not know which direction the ADU is pointing, it is always best to observe the full 36 feet (11 m) minimum safe distance.
- Using the ACU, you can set up RF radiation hazard zones to inhibit transmissions within areas frequented by your passengers and/or crew. See ***"Configuring RF Radiation Hazard Zones" on page 20*** for details.

System Overview

Your SAILOR 700 VSAT is a complete mini-VSAT Broadband communications system for mariners on the move. Using cutting-edge spread spectrum technology, which was previously only available to the military and corporate jets, the SAILOR 700 VSAT delivers a seamless and consistent Internet experience. And it all comes with an ADU that is 85% smaller and 75% lighter than traditional VSAT antennas.

As shown in the basic diagram below, the system consists of an antenna system (ADU), control unit (ACU), and modem (VMU) that connect to a land-based hub via a Ku-band satellite. The hub then provides the Internet link, as managed by the Network Operations Center. A brief description of each system component is provided on the following page. A detailed wiring diagram is provided in ***"Wiring Diagram" on page 67***.

Figure 1-2 SAILOR 700 VSAT mini-VSAT Network Diagram



System Components

The SAILOR 700 VSAT system includes the following components:

The **ADU** provides the satellite link between the onboard modem and the land-based hub. Using its integrated GPS, advanced reflector technology, and gyro stabilization, the ADU automatically locates and tracks the correct satellite, even while your vessel is on the move.

The **ACU** supplies power to the ADU, links the ADU to the VMU, and allows you to operate and configure all aspects of the system.

The **VMU**, manufactured by ViaSat, is the transceiver and "brain" of the system. It processes all incoming and outgoing TCP/IP data between the ADU and the switch using its proprietary spread spectrum technologies. It also powers the ADU's transmission and reception components, Block-Up-Converter (BUC) and Low Noise Block down-converter (LNB).

The **switch** links the system to your onboard local area network (LAN) via wired Ethernet connections. Four of its eight ports support Power over Ethernet (PoE) - they can supply power to any IEEE 802.3af-compliant device, including the Thrane IP Handset. If you connect a wireless access point to the switch, be sure to apply security settings (such as encryption) to protect the network.

The **remote service and support module** is a compact GPRS cellular modem. This unit allows Technical Support to "dial in" to your system for troubleshooting purposes.

The **Thrane IP handset** allows you to make over your Ethernet connection. The handset is not strictly dedicated to the SAILOR 700 VSAT system, but can also be used in a public network as a standard IP telephone. The IP handset is powered directly from the Ethernet switch using Power over Ethernet (PoE).

Service Activation

Before you can start using the SAILOR 700 VSAT, you need to activate the system for mini-VSAT Broadband service. To activate, simply fill out the Activation Form provided with your system. Then fax the completed form to Thrane & Thrane at the following number:

Thrane & Thrane A/S:
Fax: +45 39558888

Once Thrane & Thrane processes the form, a representative will call you to confirm your system is activated and ready for use.

KVH® INDUSTRIES
MINI-VSAT
BROADBAND℠

2. Operation

This chapter explains how to turn on and use the SAILOR 700 VSAT system. It also explains how to interpret the startup screens.

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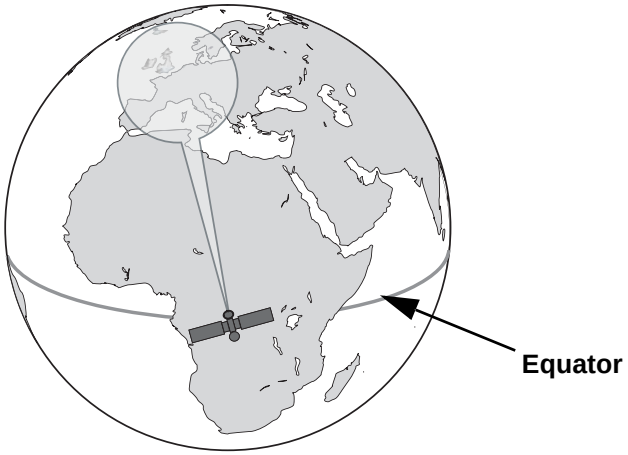
Satellite Communication Basics

Ku-band communications satellites are located in fixed positions above the Earth's equator and relay data to/from the earth within the regions that they serve. Therefore, to communicate via a given satellite, you must be located within that satellite's unique coverage area, also known as its "footprint."

TIP: *To view the latest mini-VSAT Broadband satellite coverage map, visit our website at* ***www.thrane.com****.*

Figure 2-1 Example of a Satellite Footprint



In addition, since satellites are located 22,300 miles (35,900 km) above the equator, the SAILOR 700 VSAT ADU must have a clear view of the sky to transmit and receive signals.

IMPORTANT!

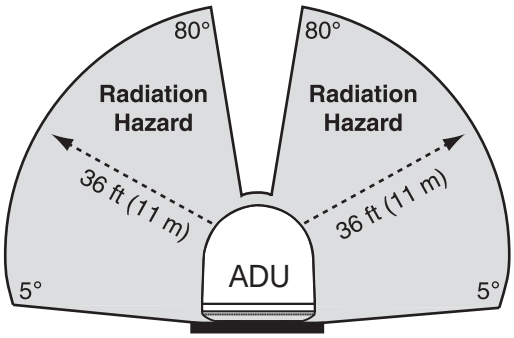
Anything that stands between the ADU and the satellite can block signals, resulting in lost data. Common causes of blockage include the ship's funnel, masts, trees, buildings, and bridges. Heavy rain, ice, or snow may also temporarily interrupt reception.

Turning On the System

Follow the steps below to turn on your SAILOR 700 VSAT system.

CAUTION

The ADU transmits RF energy that is potentially harmful. Everyone must stay more than 36 feet (11 m) away from the ADU within its 5°-80° elevation range. No hazard exists directly above the ADU and anywhere below its mounting plane.

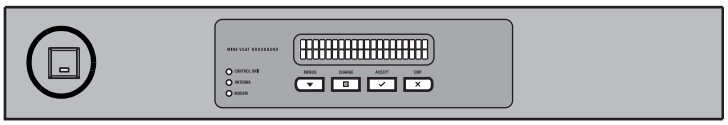


1. Make sure the ADU has a clear view of the sky.
2. Make sure power is applied to the VMU, ACU, switch and computer(s).
3. Press the power button on the VMU. The button's light should illuminate green.

   Figure 2-2 VMU Front Panel Power Switch

4. Press the power button on the ACU. The button's light should illuminate green. The ACU supplies power to the ADU.

   Figure 2-3 ACU Front Panel Power Switch



5. Turn on your networked computer(s).
6. Wait five minutes for system startup (see the next section for details).

Once the ADU finds the correct service satellite, all status lights on the ACU and the VMU should be lit green. If any lights are not lit green, refer to ***"Troubleshooting" on page 41***.

System Startup

The ACU shows the following screens during startup. If the display shows an error message, see ***"Error Messages" on page 47***.

ACU Screen	Description
`ANTENNA INITIALIZING`	The ADU is running a self test routine

`GPS: ACQUIRED`
`41.1N, 72.3W`
Note: Not for navigational use!
	When GPS acquires a fix, the display briefly shows your latitude/longitude.

`WAITING FOR MODEM`	The ADU is waiting for the VMU to initialize
`MODEM COMMS: OK`	The VMU is communicating with the ACU
`RECEIVING SATELLITE` `INFO FROM MODEM`	The VMU is providing satellite identification data to the ADU

`SEARCHING FOR 72W`
`DVB-ASSIST SATELLITE`
Note: Satellites will vary
	The ADU is searching for the DVB-Assist satellite, which helps it find the correct service satellite*

`TRACKING 72W` `DVB-ASSIST SATELLITE`	The ADU has found the DVB-Assist satellite*

`SEARCHING FOR 22W`
`SERVICE SATELLITE`
Note: Satellites will vary
	The ADU is shifting to point at the mini-VSAT Broadband service satellite

`TRACKING 22W` `SERVICE SATELLITE`	The ADU is now tracking the service satellite
`ONLINE` `TRACKING 22W`	The VMU has accessed the mini-VSAT Broadband service; the system is ready for use!

* Not displayed if DVB-Assist search mode is turned off

Using the mini-VSAT Broadband Service

Once the SAILOR 700 VSAT VMU establishes a connection with the mini-VSAT Broadband service, you can perform all of the same Internet tasks you perform at home:

- E-mail
- Video conferencing
- Internet browsing
- Weather and chart updates
- Instant messaging
- Accessing corporate networks (VPNs)
- Data transfers

IMPORTANT!

Certain applications, such as continuous streaming video, web cams, and high-speed gaming, are not supported by fixed-rate service plans. For details, be sure to read all of the General Terms and Conditions for SAILOR VSAT.

NOTE: *The system must be activated before you can use it. See* ***"Service Activation" on page 8*** *for details.*

Using the VoIP Service

The Thrane & Thrane IP Handset is used for making phone calls over an IP-based network. When used with the SAILOR 700 VSAT system, it allows you to make and receive phone calls using the mini-VSAT Broadband service.

This section explains how to use the VoIP service with the Thrane IP Handset. For information on configuration of the handset, see ***"Configuring the Thrane IP Handset for SAILOR 700" on page 39***.

Connecting the Thrane IP Handset

To connect the Thrane IP Handset, do as follows:

1. Make sure the Ethernet switch is connected to power and to the "User ENet" connector on the VMU as described in the installation manual.

2. Make sure the cradle for the IP handset is connected to one of the PoE connectors on the Ethernet switch.

If the handset is already configured and the system is powered, your handset should now be ready for use.

Check the display of the handset. When the display shows this icon in the top right corner, the handset is ready for making or receiving calls.

Placing a Voice Call from the IP Handset

NOTE: *If the handset is in the cradle while you make the call, the mode will automatically be hands-free (default function).*

When the IP handset is ready, (showing) do as follows to place a voice call **from** the handset:

Dial **00 + Country Code + Phone Number** and press

(Phone Number may include an area number).

Example: To call Thrane & Thrane in Denmark:

Dial **00 45 39558800** and press

The display of the handset shows the progress of the call.

Placing a Voice Call to the IP Handset

To place a call to a Thrane IP handset connected to the SAILOR 700 VSAT system, you need to call a central switchboard, which will put you in contact with the number of the SAILOR 700 VSAT system you wish to call. Do as follows:

1. Dial **00 45 69121665** and press
2. Have the mobile number of the SAILOR 700 VSAT system ready and follow the instructions from the switchboard.

3. Configuration

This chapter explains how to change the brightness of the ACU's display, set up an RF radiation hazard zone, turn the DVB-Assist search mode on or off, and reset the system to its factory configuration. It also explains how to configure your computer for a wired Ethernet connection to the SAILOR 700 VSAT system. For details on setting up a wireless network, refer to the instructions provided with your wireless access point (purchased separately).

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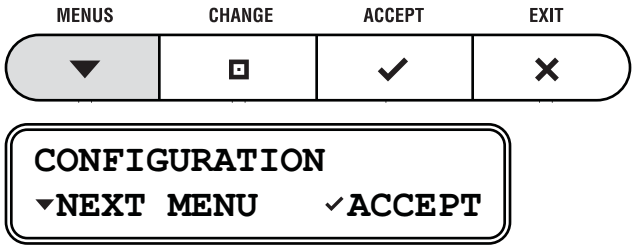
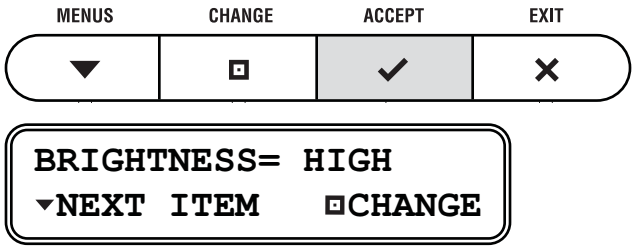
Adjusting the ACU Display Brightness

Follow the steps below to adjust the brightness of the ACU's front panel display.

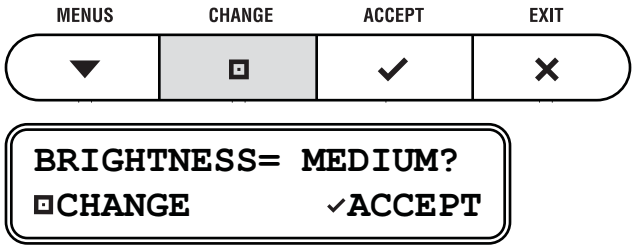
1. Press ▼MENUS until the display shows "CONFIGURATION."



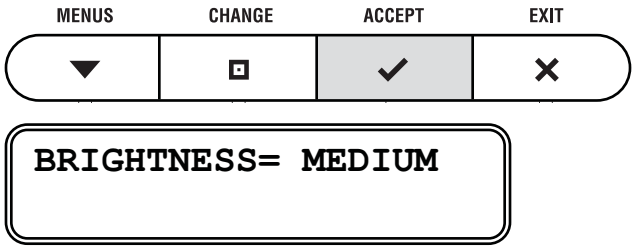
2. Press ✓ACCEPT.



3. Press ⊡CHANGE until the display shows the desired brightness setting: **HIGH**, **MEDIUM**, or **LOW**.



4. Press ✓ACCEPT.



5. Press ×EXIT to exit the menu.

Configuring RF Radiation Hazard Zones

To prevent exposure to the ADU's radiated RF energy, you can configure up to two RF radiation hazard zones for areas frequented by crew and/or passengers. (See ***"Important Safety Information" on page 5*** for details on minimum safety distances.)

When determining the need for a hazard zone, keep in mind that the ADU transmits within an elevation range of 5°-80°. Therefore, you do not need to consider any areas that are below the ADU's mounting plane, since they are safe from radiation exposure.

Whenever the ADU points within an RF radiation hazard zone, the system will disable the transmitter and the ACU will display the following message:

```
RF RADIATION HAZARD!
TRANSMIT INHIBITED
```

Once the ADU points outside the hazard zone, transmission capability will be restored.

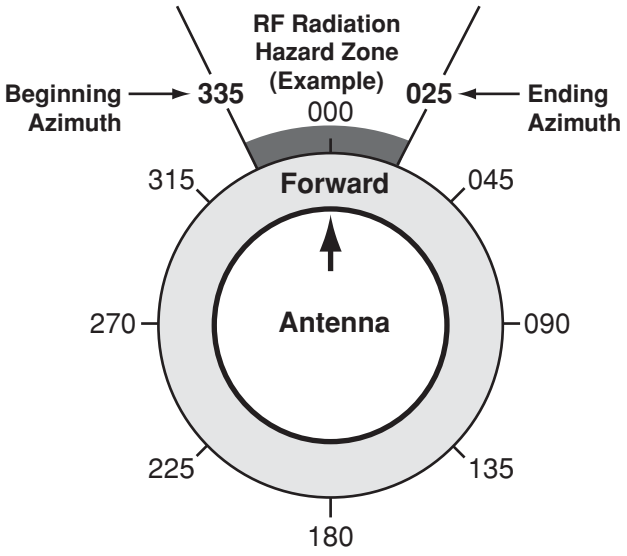
Defining an RF Radiation Hazard Zone

Follow the steps below to configure an RF radiation hazard zone.

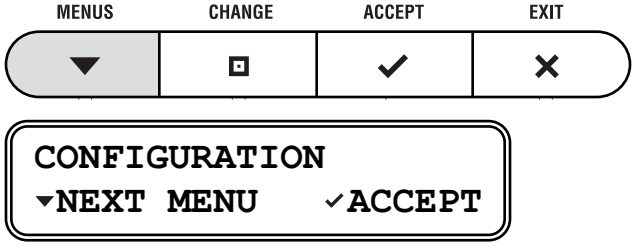
1. Determine the necessary azimuth range for the RF hazard zone. You will need to enter the beginning and ending azimuths that define the outer boundaries of the zone, **relative to the ADU's forward arrow**, which should be pointing toward the bow (see Figure 3-1).

NOTE: *Each RF hazard zone must span at least 5°. Therefore, be sure to set beginning and ending azimuths at least 5° apart.*

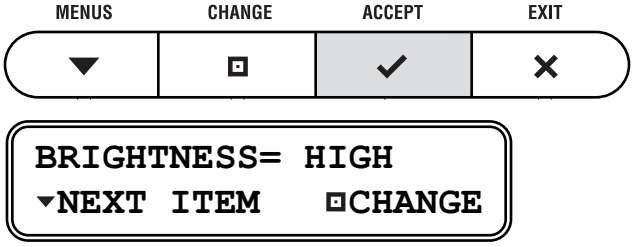
Figure 3-1 Beginning and Ending Azimuths Defining RF Radiation Hazard Zone



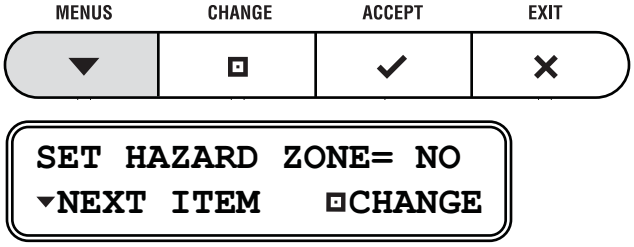
2. Press ▼MENUS until the display shows "CONFIGURATION."



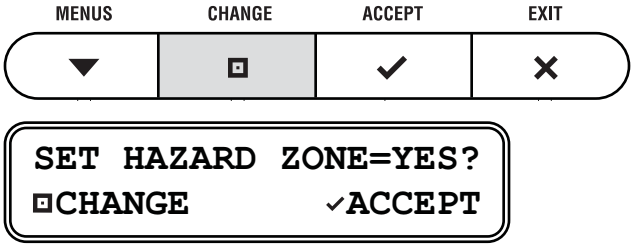
3. Press ✓ACCEPT.



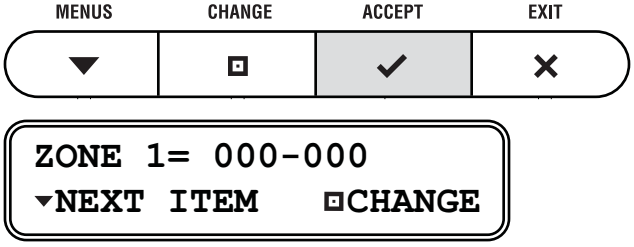
4. Press ▼MENUS until the display shows "SET HAZARD ZONE."



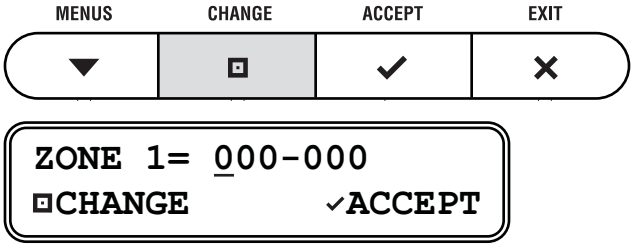
5. Press ⊡CHANGE until the display shows "SET HAZARD ZONE = YES."



6. Press ✓ACCEPT.

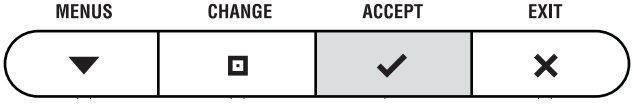


7. Press ⊡CHANGE. A cursor appears under the first number in the displayed azimuth range for RF radiation hazard zone #1.



8. Press ⊡CHANGE until the number is set to the first digit of the beginning azimuth for zone #1. *If the azimuth value is less than 100°, set the first digit to zero.*

9. Press ✓ACCEPT. The cursor moves to the next number.

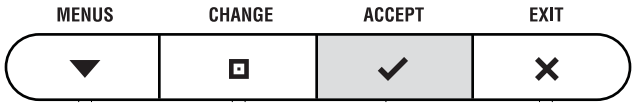


```
ZONE 1= 300-000
□CHANGE       ✓ACCEPT
```

10. Repeat steps 8 and 9 to set the remaining digits of the range of azimuths for zone #1. Once you have set the entire range, the cursor disappears from the display.

```
ZONE 1= 335-025?
□CHANGE       ✓ACCEPT
```

11. Press ✓ACCEPT. The display shows the current azimuth range for RF radiation hazard zone #2.




```
ZONE 2= 000-000
▼NEXT ITEM    □CHANGE
```

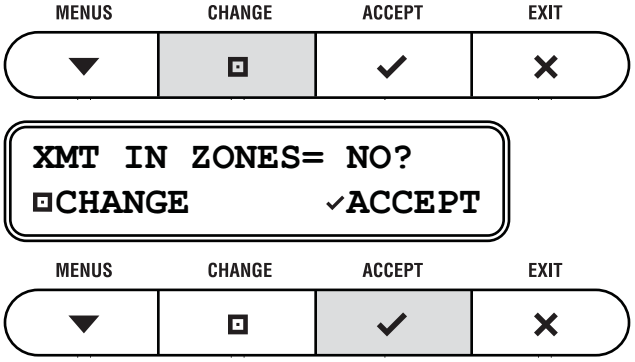
12. If you wish to set up a second RF radiation hazard zone, repeat steps 7-11. *(Be sure the second zone does not overlap the first.)* Otherwise, press ▼MENUS. The display shows the current setting for Transmit Inhibition ("XMT IN ZONES").

IMPORTANT!

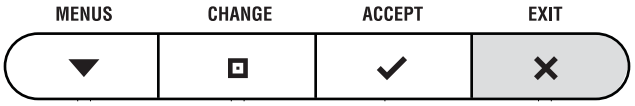
Make sure "XMT IN ZONES" is set to **NO**, so the ADU will not transmit whenever it points within one of your configured RF radiation hazard zones. If "XMT IN ZONES" is set to YES, the zones are disabled, allowing the ADU to transmit within them.

```
XMT IN ZONES= NO
▼NEXT ITEM    □CHANGE
```

13. If the display shows “XMT IN ZONES = YES,” press ⊡CHANGE until the display shows “XMT IN ZONES = NO.” Then press ✓ACCEPT.



14. Press ×EXIT to exit the menu.



Disabling RF Radiation Hazard Zones

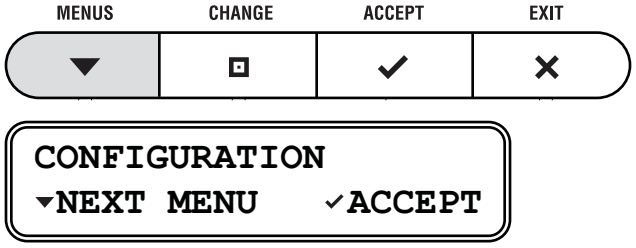
If you wish to remove all restrictions on transmissions, follow the steps below to disable your programmed RF radiation hazard zones. This function simply disables the hazard zones; it does not delete them from memory.

CAUTION

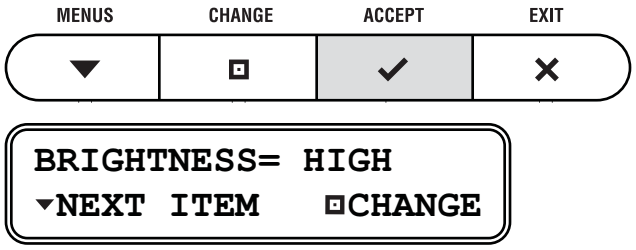
Disabling RF radiation hazard zones allows the ADU to transmit in any direction, even if the ADU is pointing in an area accessible to passengers and crew. Make certain that everyone stays a minimum safe distance away from the ADU before you transmit. Also be sure to return to this menu and restore the hazard zones when you are done transmitting.

NOTE: *You can view the currently programmed hazard zones in the ACU's Antenna Status menu (see* ***"Antenna Status Information" on page 61****).*

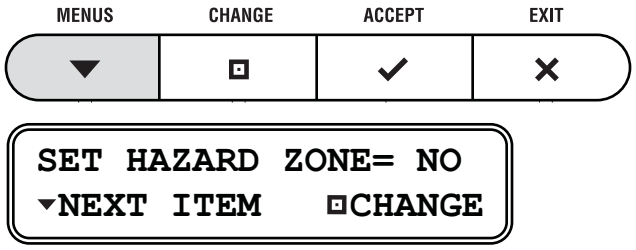
1. Press ▼MENUS until the display shows "CONFIGURATION."



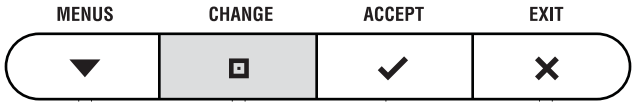
2. Press ✓ACCEPT.



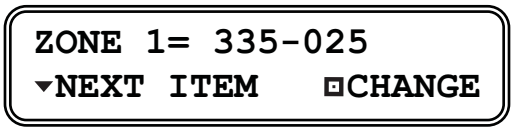
3. Press ▼MENUS until the display shows "SET HAZARD ZONE."



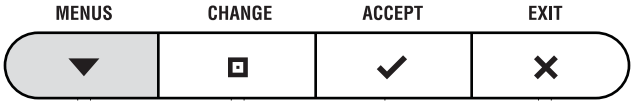
4. Press ⊡CHANGE until the display shows "SET HAZARD ZONE = YES."

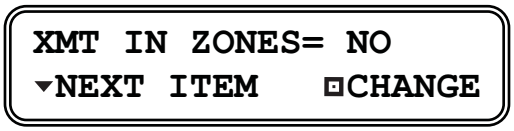


5. Press ✓ACCEPT.

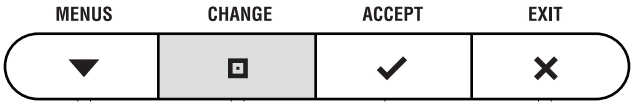


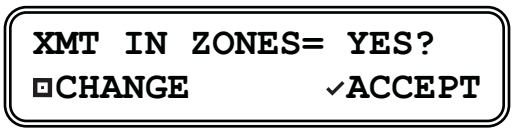
6. Press ▼MENUS until the display shows "XMT IN ZONES."



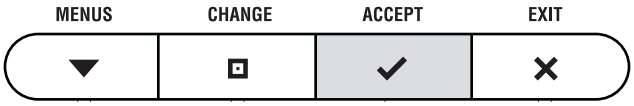


7. Press ⊡CHANGE until the display shows "XMT IN ZONES = YES."





8. Press ✓ACCEPT.



9. Press ×EXIT to exit the menu.

Setting DVB-Assist Search Mode On/Off

In most conditions, you should keep the DVB-Assist search mode turned on. With DVB-Assist enabled, the SAILOR 700 VSAT ADU finds a DVB-Assist satellite first before it shifts to point at the mini-VSAT Broadband service satellite. This process speeds up the system startup time, since the ADU normally finds the service satellite much faster when using the DVB-Assist satellite as a guidepost.

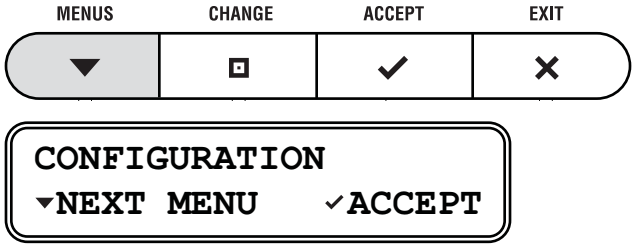
However, if the ADU is unable to find the DVB-Assist satellite after 20 minutes, and you found none of the issues listed in ***"Five Simple Checks" on page 43***, you may turn off the DVB-Assist search mode and force the ADU to search for the service satellite directly upon startup. *If you choose this option, be sure the vessel is operating in calm seas; excessive motion will hinder the ADU's ability to find the satellite.*

IMPORTANT!

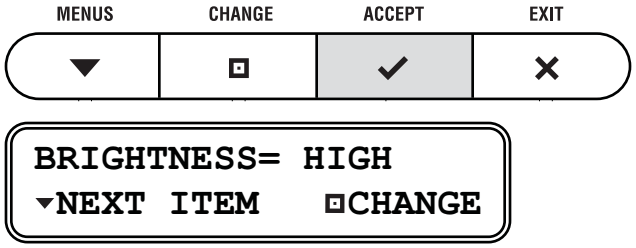
The ADU performs best with the DVB-Assist search mode enabled. Do not turn it off unless the ADU cannot find the DVB-Assist satellite.

Follow the steps below to set the DVB-Assist search mode On or Off.

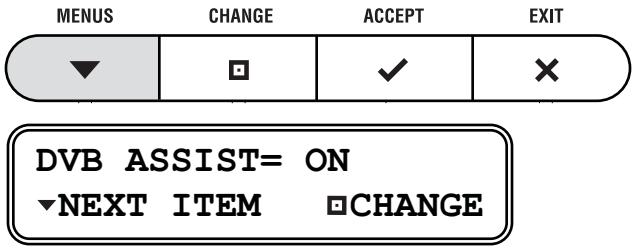
1. Press ▼MENUS until the display shows "CONFIGURATION."



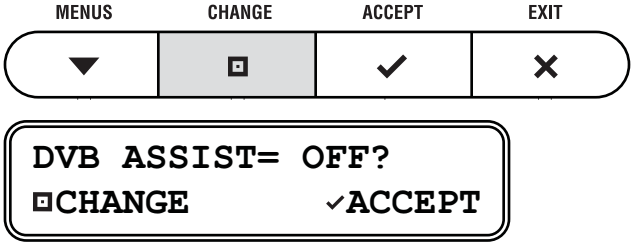
2. Press ✓ACCEPT.



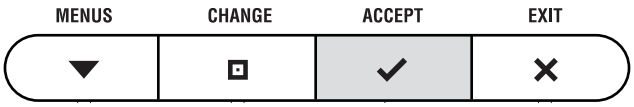
3. Press ▼MENUS until the display shows "DVB ASSIST."



4. Press ⊡CHANGE until the display shows the desired DVB-Assist setting: **ON** or **OFF**.



5. Press ✓ACCEPT.

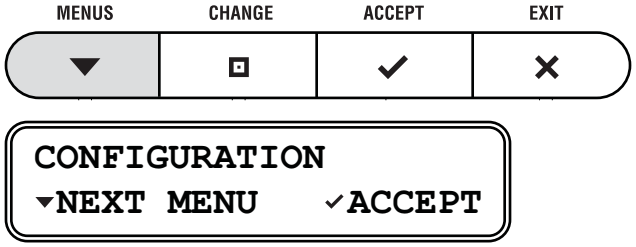


Resetting the System to Factory Conditions

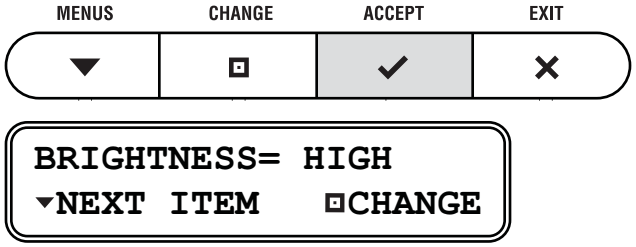
Follow the steps below to reset the SAILOR 700 VSAT system to its original factory configuration.

> **CAUTION**
>
> Resetting the system clears all RF radiation hazard zones. The ADU will be able to transmit in any direction until you reprogram the hazard zones into the ADU.

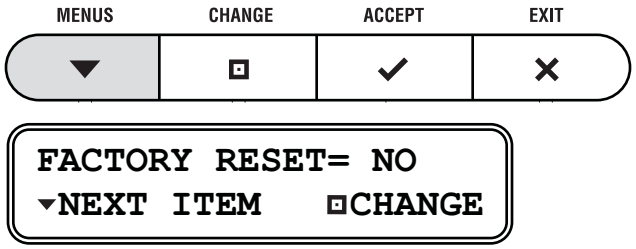
1. Press ▼MENUS until the display shows "CONFIGURATION."



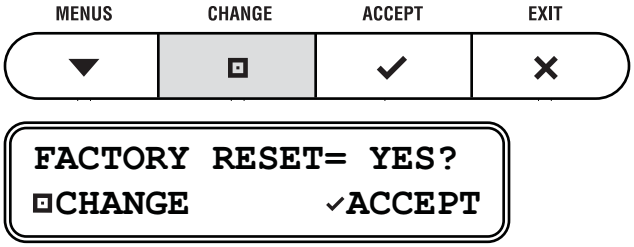
2. Press ✓ACCEPT.



3. Press ▼MENUS until the display shows "FACTORY RESET."

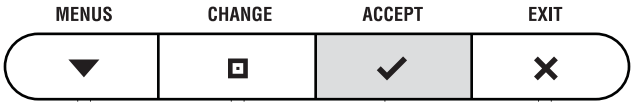


4. Press ⊡CHANGE until the display shows “FACTORY RESET= YES.”



5. Press ✓ACCEPT.

6. Press ✓ACCEPT again to reset the system.



Configuring Your Computer for mini-VSAT Broadband

Follow the steps below to configure your computer for DHCP addressing. This will allow your computer to communicate with the VMU via its Ethernet connection.

NOTE: *If you wish to set up a wireless connection, set up and test a wired Ethernet connection first. Then purchase a wireless access point (WAP), connect it to the switch, and follow the wireless setup instructions provided with the WAP.*

IMPORTANT!

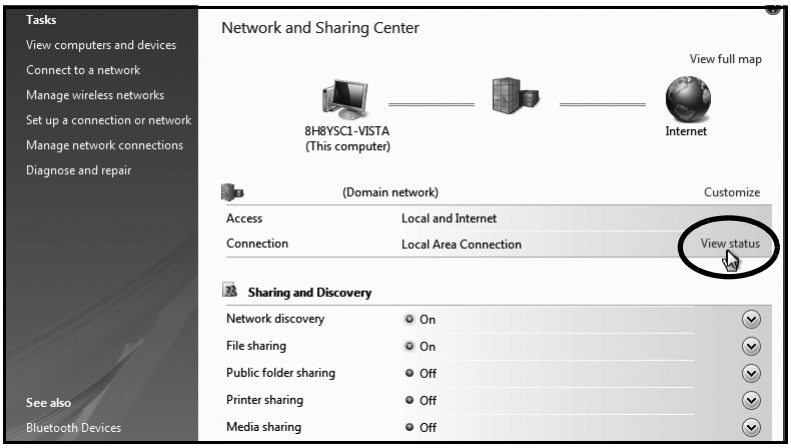
When setting up a wireless network, be sure to apply security settings, such as encryption, to protect your network from outside intrusion. If your network is not secure, outsiders within range of your wireless network will be able to use your wireless connection without your knowledge.

NOTE: *Thrane & Thrane Technical Support fully supports the three operating systems described here: Windows Vista™, Windows XP, and Macintosh® OS X.*

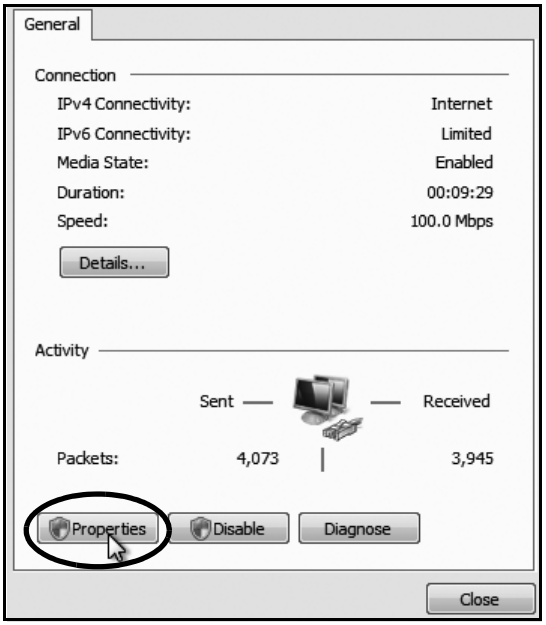
Windows Vista

Follow the steps below to configure a Windows Vista computer.

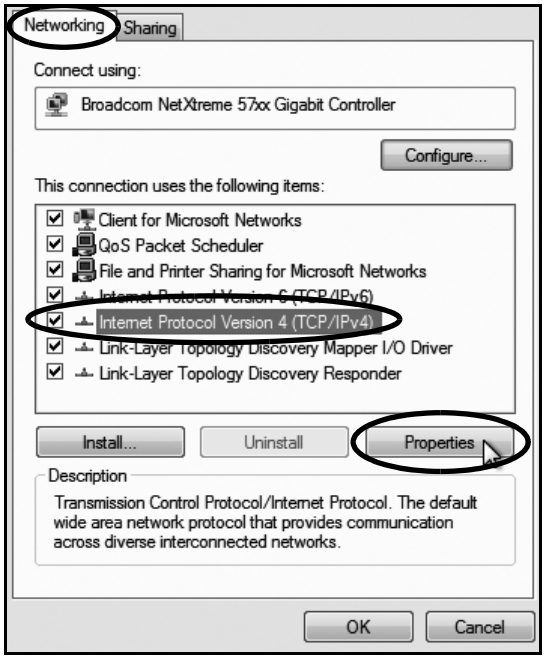
1. At the Windows Control Panel, double-click the **Network and Sharing Center** icon. *You can find the Control Panel either through the Start menu or "My Computer."*
2. At the Network and Sharing Center window, double-click the **View Status** link for the Ethernet connection you are using for mini-VSAT Broadband.



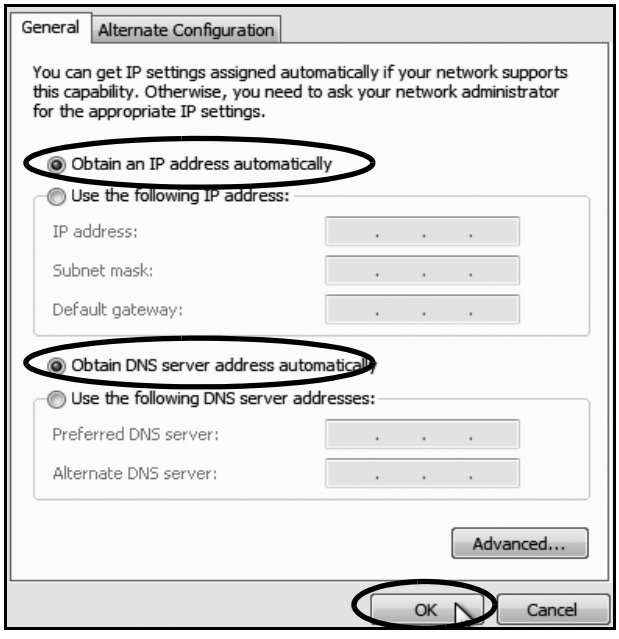
3. At the Local Area Connection Status window, click **Properties**. *If this screen doesn't appear, just skip to Step 4.*



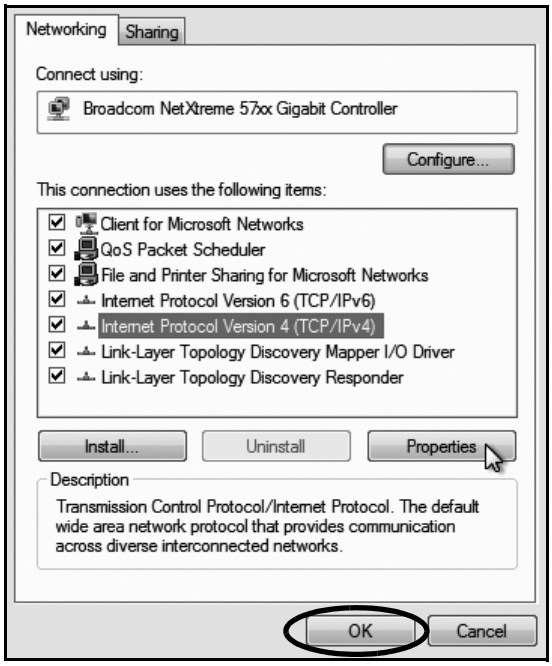
4. At the Local Area Connection Properties window, select the **Networking** tab. Then select **Internet Protocol Version 4** and click **Properties**.



5. At the Internet Protocol Properties window, select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Then click **OK**.


General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

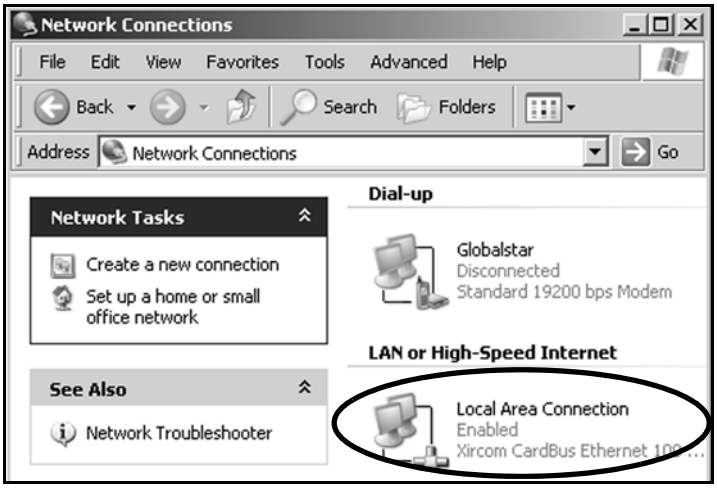
6. At Local Area Connection Properties, click **OK**.



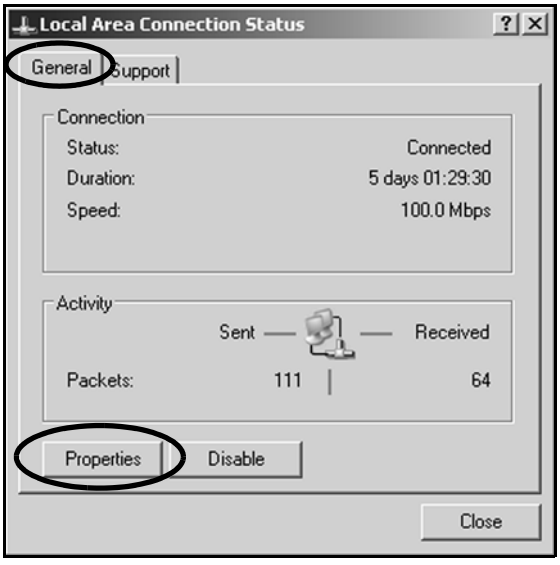
Windows XP

Follow the steps below to configure a Windows XP computer.

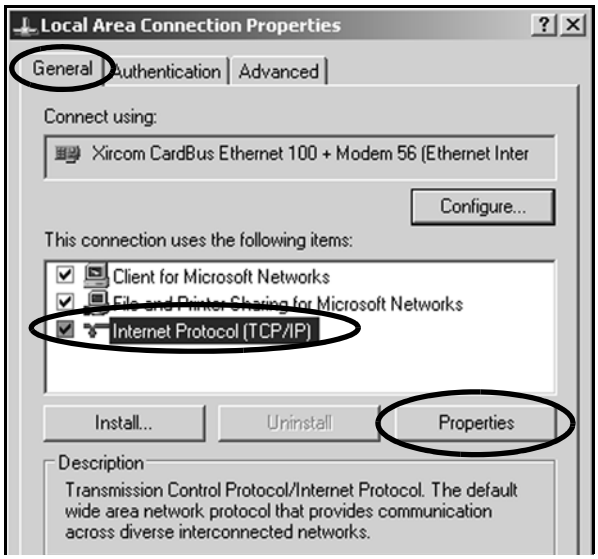
1. At the Windows Control Panel, double-click the **Network Connections** icon. *You can find the Control Panel either through the Start menu or "My Computer."*
2. At the Network Connections window, double-click the **Local Area Connection** icon for the Ethernet connection you are using for mini-VSAT Broadband.



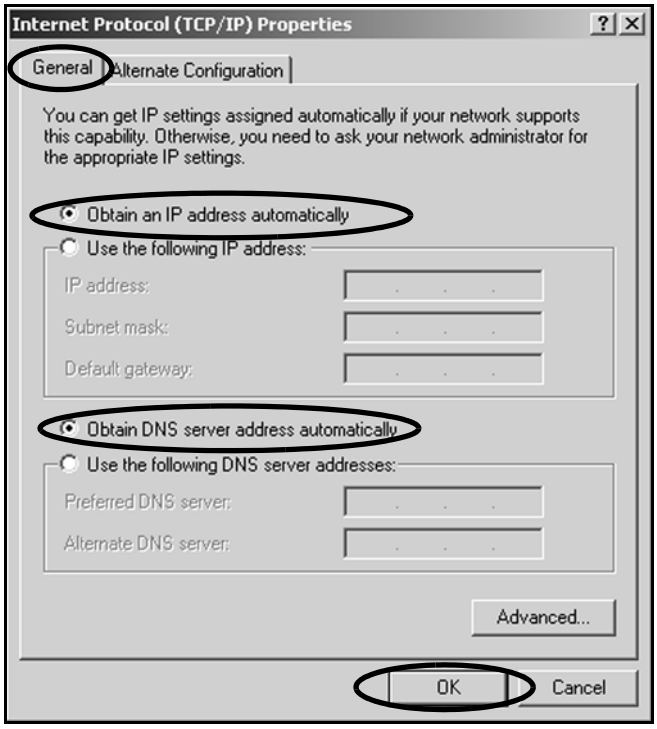
3. At the Local Area Connection Status window, select the General tab. Then click the **Properties** button. *If this screen doesn't appear, simply skip to Step 4.*



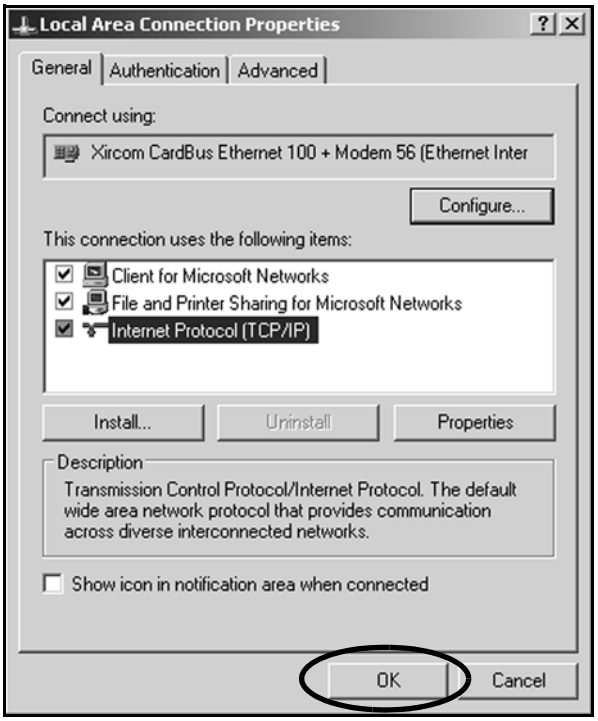
4. At the Local Area Connection Properties window, select the **General** tab. Then select **Internet Protocol (TCP/IP)** and click **Properties**.



5. At the Internet Protocol (TCP/IP) Properties window, select the **General** tab. Then select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Then click **OK**.


Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

6. At Local Area Connection Properties, click **OK**.



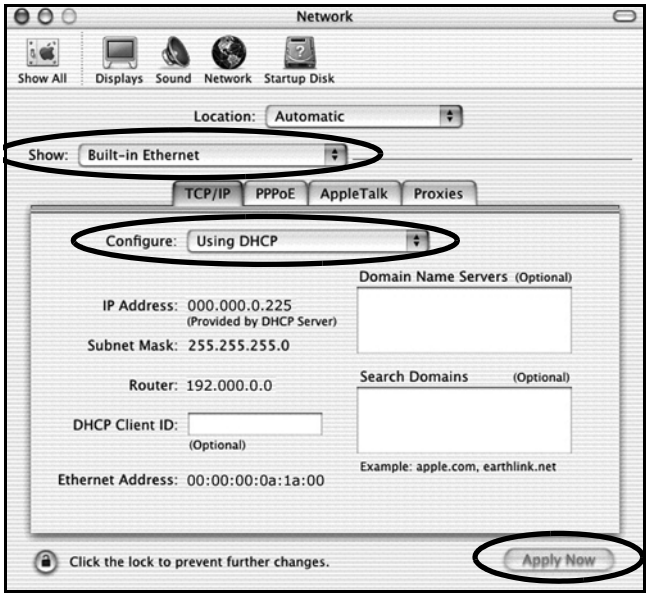
7. Restart your computer.

Mac OS X

Follow the steps below to configure a Mac OS X computer.

1. At System Preferences, click the **Network** icon.
2. At the Network window, select the following:

- Show: **Built-in Ethernet**
- Configure: **Using DHCP**
- Leave all text boxes blank.



3. Click **Apply Now**.

Configuring the Thrane IP Handset for SAILOR 700

The following section explains how to configure the Thrane IP handset with the SAILOR 700 VoIP account information and codec.

The SAILOR 700 VoIP account information is supplied by the Thrane & Thrane distributor who installed the SAILOR 700 system. The following information is needed to configure the IP handset:

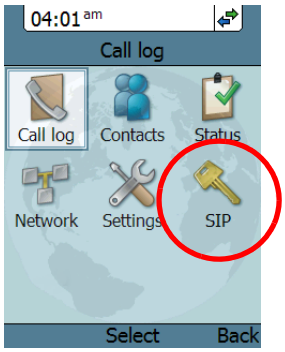
- SIP Server IP address (sipproxy.thrane.com)
- Username for the SAILOR 700 VoIP account
- Password for the SAILOR 700 VoIP account
- Codec G.729

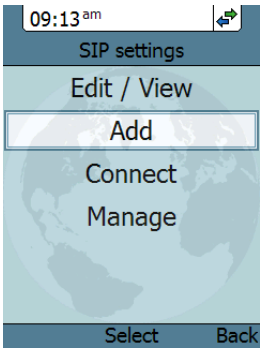
The SAILOR 700 VoIP account username and password is supplied by your distributor when you sign for the voice subscription for the SAILOR 700 system.

If the handset has been switched off, you can switch it back on by pressing and holding the key until the display lights up.

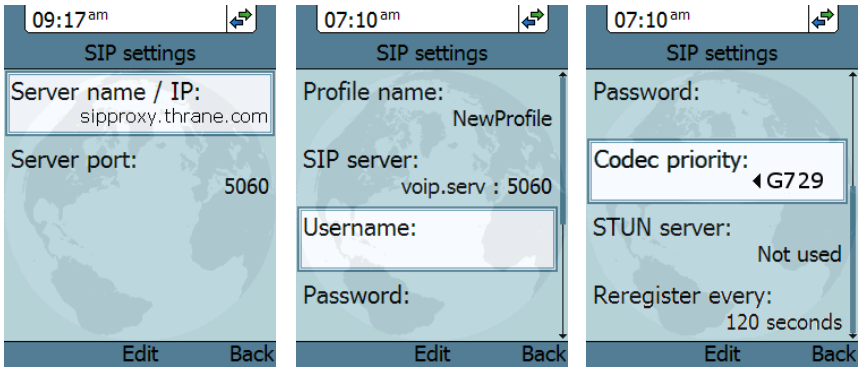
To configure the handset, do as follows:

1. Select **Menu > SIP > Options** and **Add** to configure a new SIP profile.





2. Enter following under the SIP settings:
   - Profile name, e.g. SAILOR,
   - Server name / IP: sipproxy.thrane.com
   - Username (supplied by the distributor)
   - Password (supplied by the distributor)
   - Set Codec Priority to G729.



The Thrane IP Handset is now configured to use the voice channel on the SAILOR 700 VSAT system.

4. Troubleshooting

This chapter identifies basic problems along with their possible causes and solutions. It also explains what the status lights indicate, how to use the diagnostic functions, and how to get technical support.

Contents

Five Simple Checks 43
Control Unit (ACU) Status Lights 44
Modem (VMU) Status Light 46
Error Messages 47
Troubleshooting a VoIP Service Problem 50
Viewing Status Information on Your Web Browser 52
Viewing Status Information on the ACU 58
Calibrating the ADU Gyros 64
Technical Support 66

Five Simple Checks

If you are experiencing a problem with your SAILOR 700 VSAT system, first check the five simple things below. If these checks do not lead you to the problem, contact a Thrane & Thrane-authorized technician (see ***"Technical Support" on page 66***).

Are all lights on the ACU and VMU lit green?

There are three status lights on the front panel of the ACU and one status light on the VMU. If any of these lights are not lit green, see ***"Control Unit (ACU) Status Lights" on page 44*** and ***"Modem (VMU) Status Light" on page 46*** for failure indications.

Are any error messages displayed on the control panel?

If the control panel is showing an error message, see ***"Error Messages" on page 47*** for error definitions.

Can the ADU find the satellite?

If the ADU is continuously searching for the satellite, check the area around the ADU for blockage. The ADU needs an unobstructed view of the sky to receive satellite signals. Common causes of blockage include trees, buildings, bridges, mountains, and nearby equipment or structures on the vessel. You can find which direction the ADU is pointing by viewing the "AZ/EL" status on the ACU; see ***"Antenna Status Messages" on page 62***. If there is no blockage, and the ADU can't find the satellite after 20 minutes, try disabling the DVB-Assist search mode (see ***"Setting DVB-Assist Search Mode On/Off" on page 27***). If the ADU is still unable to find the satellite, you might be located outside of the mini-VSAT Broadband service coverage area (the latest coverage information is available at ***www.thrane.com***).

Are all system components powered on and connected properly?

Make sure power is applied to all system components, including the VMU, ACU and switch. Also make sure all of the interconnecting cables are connected tightly.

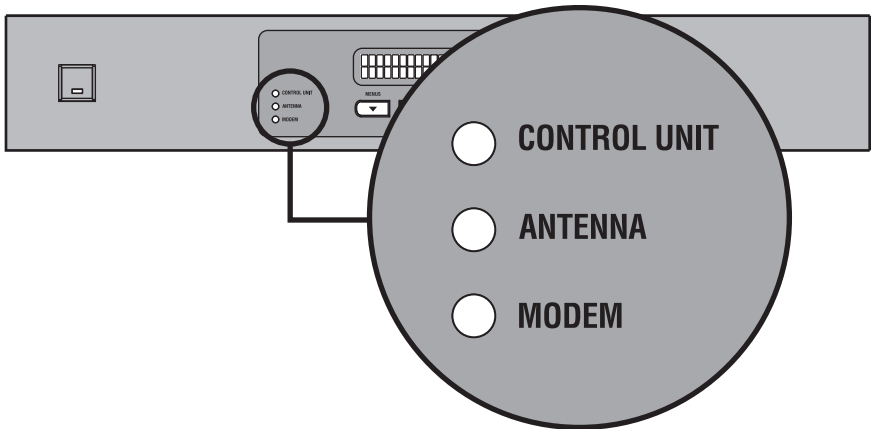
If you can't connect via a wireless network, does a wired connection work?

If you have a wireless network onboard, but you are unable to connect to the Internet while the SAILOR 700 VSAT system is online, connect your computer directly to the switch via a straight-through (not crossover) Ethernet cable, then restart your computer. If you can then access the Internet, there is a problem with your wireless network.

Control Unit (ACU) Status Lights

Three status lights on the front of the ACU indicate the current status of the system and can help you identify problems quickly.

Figure 4-1 Control Unit Status Lights



During normal operation, all three status lights should be lit green. The following tables explain what the different light conditions indicate.

CONTROL UNIT Light

The table below explains what the CONTROL UNIT light indicates.

Light is...	Indicates	Description
Off	Off	ACU is powered off or no power input
Green	OK	Good input power; ACU is operational
Orange	Bad power	Bad power supply circuit inside the ACU
Red	Fault	Error detected during ACU self test; try turning the ACU off, then back on

ANTENNA Light

The table below explains what the ANTENNA light indicates.

Light is...	Indicates	Description
Off	Off	No power input to the ADU
Green	Tracking	ADU is tracking the satellite
Green, flashing	Searching	ADU is searching for the satellite
Red	Fault	Error detected; see error message on display

MODEM Light

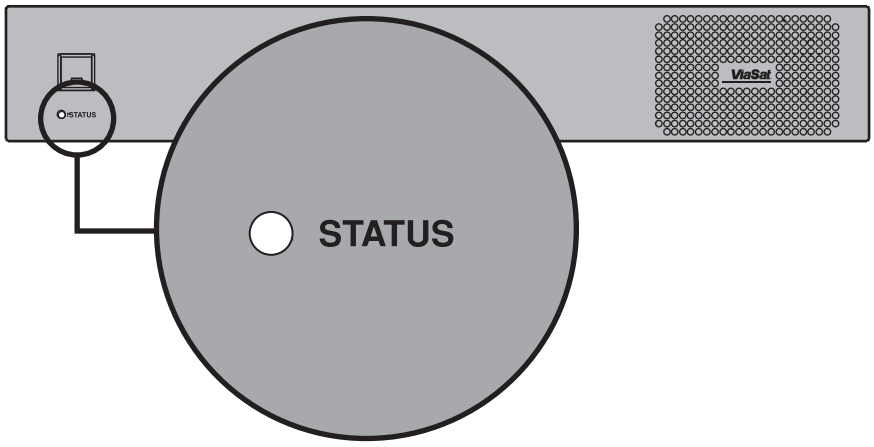
The table below explains what the MODEM light indicates.

Light is...	Indicates	Description
Off	Off	VMU powered off
Green	Online	VMU online and logged into the mini-VSAT Broadband service
Green, flashing	Comms OK	VMU is communicating with the ADU
Orange	Fault	Error detected; see error message on display
Red	No comms	ACU has lost communications with the VMU; check wiring

Modem (VMU) Status Light

A status light on the front of the VMU indicates the current status of the VMU and can help you identify problems.

Figure 4-2 VMU Status Light



During normal operation, the status light should be lit green. The following table explains what the different light conditions indicate.

Light is...	Indicates	Description
Off	Off	VMU is powered off or no power input
Green	Online	VMU is logged into the mini-VSAT Broadband network
Green, flashing	Transmitting	VMU is transmitting data
Red	Fault	Error detected in VMU; try turning the VMU off, then back on

Error Messages

The table below lists error messages that might appear on the ACU display to indicate a system problem. Many of these faults should only be repaired by a Thrane & Thrane-authorized technician. For details on finding a Thrane & Thrane-authorized technician, see ***"Technical Support" on page 66***.

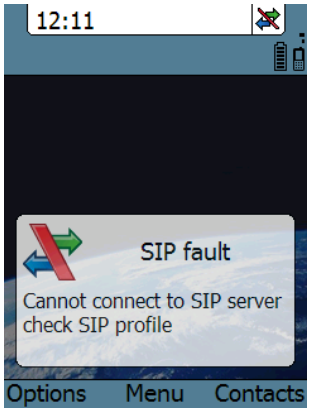
Error Message	Description
`WAITING FOR GPS`	The system is not yet receiving valid position data from the GPS. It might take a few minutes for the GPS to acquire a fix. If this message does not clear, check for ADU blockage. You can also try turning the ACU off, then back on.
`ERROR:` `GPS FAILURE`	The GPS is not communicating with the ACU. Try turning the ACU off, then back on. If the error persists, the GPS module inside the ADU might need to be replaced. Contact a Thrane & Thrane-authorized technician.
`OFFLINE` `OUTSIDE COVERAGE`	Your vessel is located outside the mini-VSAT Broadband coverage area, where service is unavailable (or you are located within a governmentally restricted area). Service will be restored once you reenter the coverage area.
`TRANSMIT INHIBITED` `BY CTRL UNIT`	The transmitter is temporarily disabled due to severe sea conditions or excessive vibration.
`RF RADIATION HAZARD!` `TRANSMIT INHIBITED`	The ADU is pointing within one of your programmed RF radiation hazard zones. See ***"Configuring RF Radiation Hazard Zones" on page 20*** for details.
`ERROR:` `ANTENNA AZ ASSEMBLY`	The ADU's azimuth motor or limit switch failed. Contact a Thrane & Thrane-authorized technician.
`ERROR:` `ANTENNA EL ASSEMBLY`	The ADU's elevation motor or limit switch failed. Contact a Thrane & Thrane-authorized technician.
`ERROR:` `ANTENNA SKEW ASSMBLY`	The ADU's skew motor or limit switch failed. Contact a Thrane & Thrane-authorized technician.

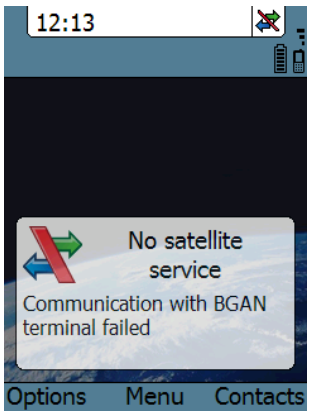
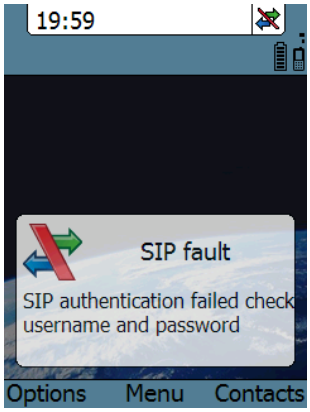
Error Message	Description
ERROR: CTRL UNIT PWR SUPPLY	The ACU is not supplying enough power to the ADU. Contact a Thrane & Thrane-authorized technician.
ERROR: ANTENNA POWER SUPPLY	The ADU's power supply circuit might have failed. Contact a Thrane & Thrane-authorized technician.
ERROR: ANTENNA POWER SHORT	There is a short circuit in the ADU power cable. Check the cable.
ERROR: ANTENNA POWER OPEN	There is an open circuit in the ADU power cable. Check the cable.
ERROR: BUC POWER SHORT	There is a short circuit in the BUC power cable (between the ACU and the VMU) or the transmit (TX) RF cable. Check the cables.
ERROR: BUC POWER OPEN	There is an open circuit in the BUC power cable (between the ACU and the VMU) or the transmit (TX) RF cable. Check the cables.
ERROR: MODEM OVERTEMP	The VMU is disabled because its temperature has risen above 85°C. Listen for the cooling fan inside the VMU. If you don't hear the fan, contact a Thrane & Thrane-authorized technician. If you hear the fan, turn off the system and allow it to cool down. You might need to relocate the unit to an area that provides better ventilation.
ERROR: CTRL UNIT OVERTEMP	The ACU has stopped supplying ADU and BUC power because its temperature has risen above 85°C. Turn off the system and allow it to cool down. You might need to relocate the unit to an area that provides better ventilation.
ERROR: ANTENNA OVERTEMP	The ADU is disabled because its temperature has risen above 85°C. Turn off the system and allow it to cool down.

Error Message	Description
ERROR: MODEM COMM FAILURE	The ACU has lost communications with the VMU. Ensure the VMU is powered on and check the interconnecting cables. You can also try turning the VMU off, then back on. If the error persists, contact a Thrane & Thrane-authorized technician.
ERROR: NO LNB POWER	The ADU's LNB (low noise block) is not receiving 12-18 VDC from the VMU's "Rx RF" port. Ensure the VMU is turned on and check the RX RF cable.
ERROR: RF SOFTWARE FAILURE	The ADU's RF software might be corrupted. Check the wiring and try turning the ACU and VMU off, then back on. If the error persists, contact a Thrane & Thrane-authorized technician.
ERROR: ANTENNA COMM FAILURE	The ACU has lost communications with the ADU. Check the wiring and try turning the ACU and VMU off, then back on. If the error persists, contact a Thrane & Thrane-authorized technician.
ERROR: NO DVB-ASSIST INFO	The VMU is not providing any data for identifying the DVB-Assist satellite. Try turning the ACU and VMU off, then back on. If the error persists, contact a Thrane & Thrane-authorized technician.
WARNING: BAD DVB-ASSIST INFO	The VMU is not providing valid data for identifying the DVB-Assist satellite. Contact a Thrane & Thrane-authorized technician.
WARNING: MODEM LAN LINK DOWN	The VMU does not detect a local area network (LAN) on its "User Enet" port. Make sure the switch is connected to the VMU via a straight-through, not crossover, cable.
CABLE UNWRAP PLEASE WAIT	The ADU is unwrapping its internal cable; wait 30 seconds.

Troubleshooting a VoIP Service Problem

If you have problems establishing a VoIP connection with your Thrane IP Handset, you may use the following guidelines:

Problem	Remedies
No power in the handset	• Check that the IP handset is plugged in to the supplied D-Link PoE Switch in port 1, 2, 3 or 4. These are the only four sockets that support PoE. • Check that the D-Link PoE switch is powered (green light in System Power LED on the front of the PoE switch). • If there is no green light in the System Power LED, check power to the AC/DC power supply for the PoE switch.
The handset display shows the following error message: 	• Check that the SIP settings are entered correctly in the SIP profile in the handset. (Select **SIP > Options > Edit/View**)[a] • Check that the IP address of the IP handset is correct. Default setting is DHCP enabled. (Select **Network > Settings** and check the IP address) • Check that the SAILOR 700 VSAT system is online on the Internet by sending a ping command from the DOS command prompt to a known IP address, such as **4.2.2.1**, which is a DNS server that answers to ping commands. • Check that your Thrane Reseller has activated your SAILOR 700 VSAT Voice account.

Problem	Remedies
The handset display shows **the** following error message: 	• Check that a new SAILOR SIP profile for the SAILOR 700 VoIP service is created and selected instead of the BGAN profile. (Select **SIP** from the handset menu and check that the correct profile is selected. If not, scroll to the profile you need and select **Connect**. If no profile is created for your SAILOR 700 VSAT system, you must create a new profile as described in the Configuration chapter**)**
The handset display shows **the** following error message: 	• Check the Username and Password in the SAILOR SIP profile in the handset. (Select **SIP > Options > Edit/View** and check that the user name and password correspond to the information from your distributor**)** • Check that your Thrane Reseller has activated your SAILOR 700 Voice account.

a. For information on how to configure the IP handset, refer to ***"Configuring the Thrane IP Handset for SAILOR 700" on page 39***.

Viewing Status Information on Your Web Browser

Complete system status information is available via the VMU's local web interface. Simply open the web browser on any networked computer and enter the following web address:

http://192.168.0.1

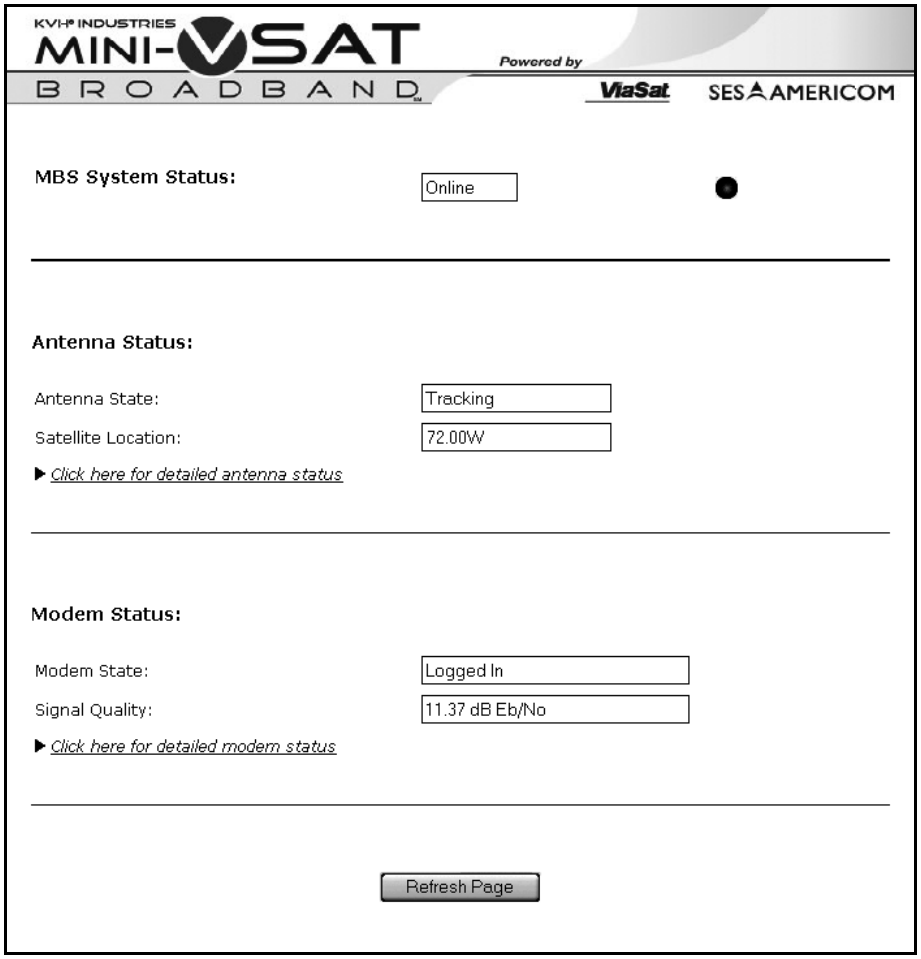
You will then need to enter the following user name and password:

User name: **KVH** (all caps)

Password: Leave blank

As long as the VMU is connected and functioning properly, a system status page will display in your browser.

Figure 4-3 System Status Page Via VMU Web Interface



The System Status page provides the following information:

Status Message	Description
MBS System Status	• Online - VMU is connected to the mini-VSAT Broadband service • Offline - VMU is not connected to the service
Antenna State	General status of the ADU: • Tracking - Tracking the service satellite • Signal Acquisition - Searching the sky for the service satellite • Offline - Initializing • Tracking - Tx Inhibit - Tracking the service satellite, but inhibited from transmitting due to either an RF hazard zone or location within a restricted area • Error: ACU Fault - Error detected in the ADU or ACU
Satellite Location	Longitude of the currently tracked satellite
Modem State	Should be “Logged In” when the VMU is online
Signal Quality	Must be greater than 2 dB for proper operation

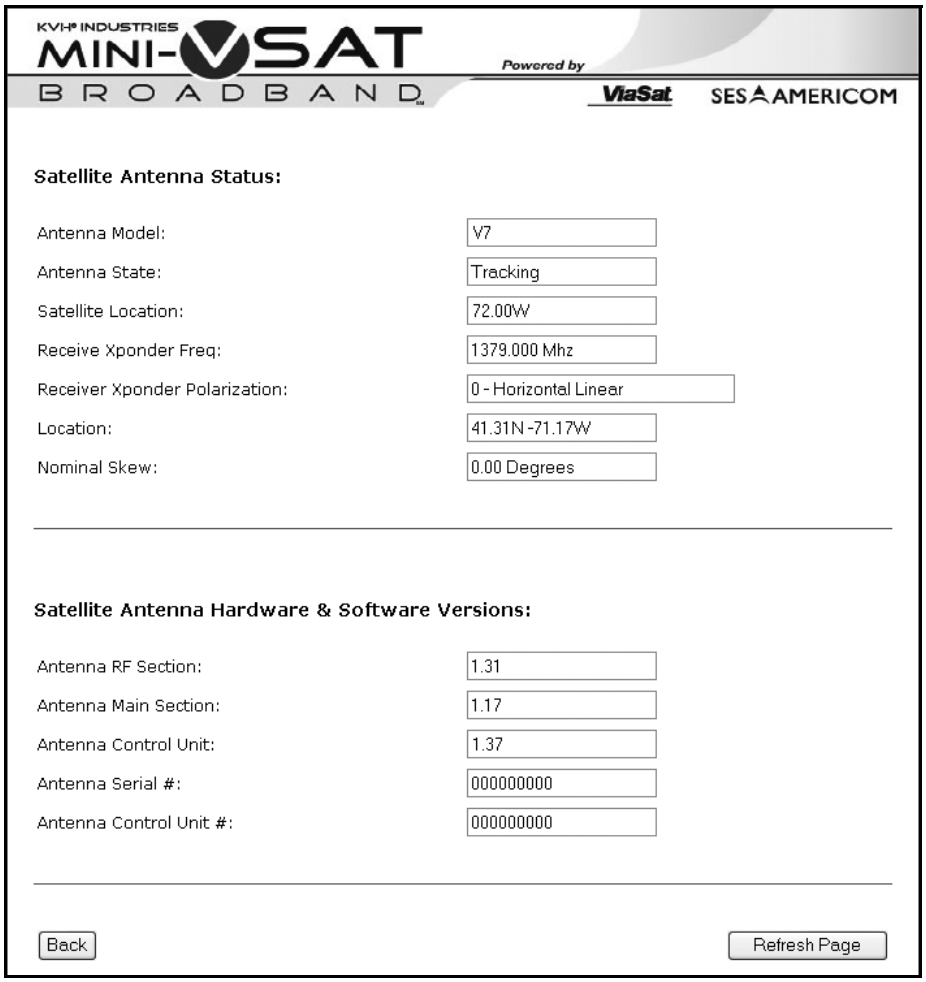
For additional ADU status information, click the link for “detailed antenna status” and refer to ***“Detailed Antenna Status” on page 54***.

For additional VMU status information, click the link for “detailed modem status” and refer to ***“Detailed Modem Status” on page 56***.

Detailed Antenna Status

When you click the link for “detailed antenna status,” the following web page is displayed.

Figure 4-4 Detailed Antenna Status Page



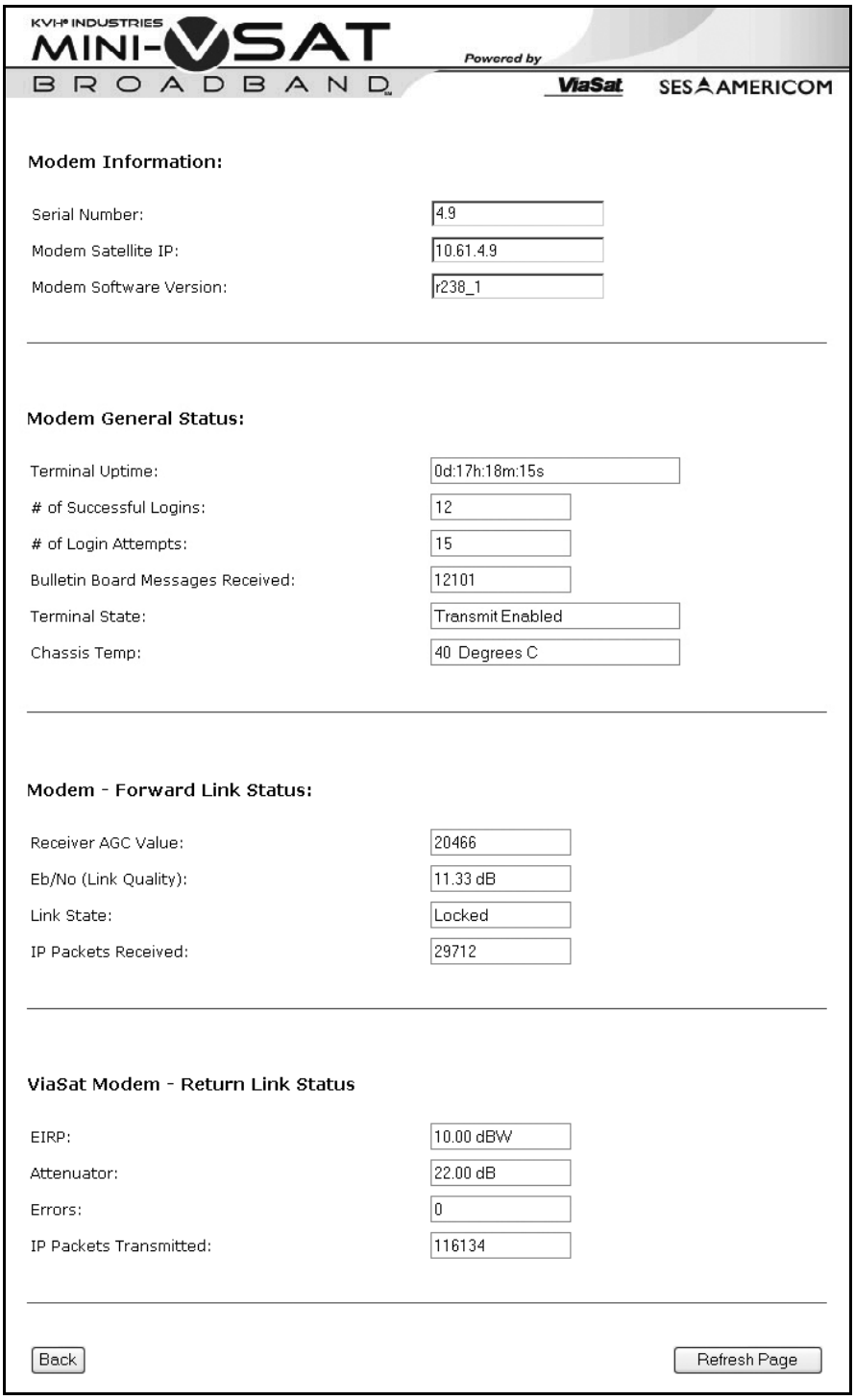
The Detailed Antenna Status page provides the following information:

Status Message	**Description**
Antenna Model	TracPhone V7 (SAILOR 700 VSAT)
Antenna State	Same as System Status page
Satellite Location	Same as System Status page
Receive Xponder Freq	Frequency of the satellite downlink (in MHz)
Receiver Xponder Polarization	Polarization of the satellite downlink: • Horizontal Linear • Vertical Linear
Location	Vessel position reported by the ADU's GPS
Nominal Skew	LNB skew angle
Antenna RF Section	ADU RF software version
Antenna Main Section	ADU main software version
Antenna Control Unit	ACU software version
Antenna Serial #	ADU serial number
Antenna Control Unit #	ACU serial number

Detailed Modem Status

When you click the link for “detailed modem status,” the following web page is displayed.

Figure 4-5 Detailed Modem Status Page



The Detailed Modem Status page provides the following information:

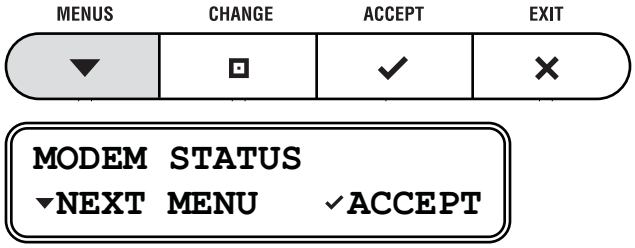
Status Message	**Description**
Serial Number	VMU serial number
Modem Satellite IP	External IP address of the VMU; identity of the VMU on mini-VSAT Broadband network
Modem Software Version	VMU software version
Terminal Uptime	Length of time (in days:minutes: hours:seconds) that the VMU has been in operation since its last restart
# of Successful Logins	Number of times the VMU has logged into the network
# of Login Attempts	Number of times the VMU has attempted to log into the network
Bulletin Board Messages Received	Number of bulletin board messages the VMU has received from the hub
Terminal State	Should be “Transmit Enabled” when tracking the service satellite
Chassis Temp	Temperature of the VMU’s chassis (in °C)
Receiver AGC Value	Receiver gain; RF level indication
Eb/No	Quality of the received digital signal; should be greater than 2 dB
Link State	Should be “Locked” when tracking the service satellite
IP Packets Received	Data received by the VMU
EIRP	Output power of the ADU
Attenuator	Set by the hub; should be greater than 12 dB
Errors	Dropped data packets; should not be incrementing in large numbers
IP Packets Transmitted	Data transmitted by the VMU

Viewing Status Information on the ACU

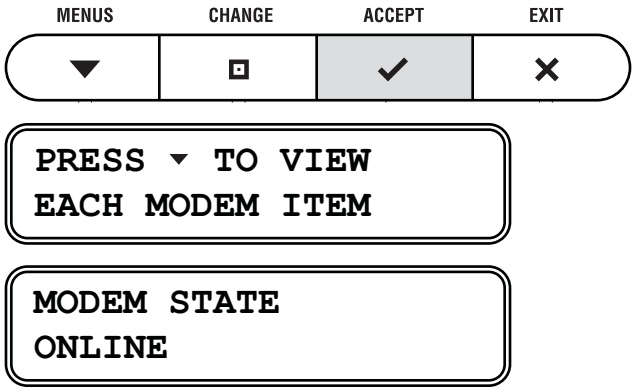
If you are unable to view the status information screens on the VMU's web interface, you can also view system status information on the ACU's display. You can select either modem or antenna status information from the main menu.

Modem Status Information

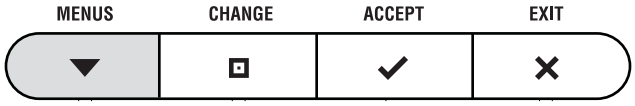
1. Press ▼MENUS until the display shows "MODEM STATUS."



2. Press ✓ACCEPT to start viewing the modem status screens.



3. Press ▼MENUS to scroll forward through the status messages. Press ⊡CHANGE to scroll backward. When you are done reviewing status messages, press ×EXIT.



Modem Status Messages

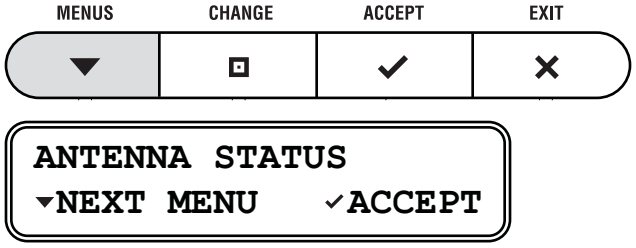
The table below lists all of the modem status messages.

Status Message	Description
MODEM STATE ONLINE	General status of the VMU: • Online - VMU is connected to the mini-VSAT Broadband service • Offline - VMU is not connected to the service • Initializing • Attempting Login • Waiting for Hub Comm • Transmit Disabled
ETHERNET LAN STATUS LINK OK	Status of the Ethernet local area network (LAN) connection: • Link OK • Link Down
SERVICE SATELLITE 72.5W	Satellite currently selected for mini-VSAT Broadband service
DOWNLINK FREQUENCY 11.840 GHZ	Frequency of the satellite downlink (in GHz)
DOWNLNK POLARIZATION HORIZONTAL	Polarization of the satellite downlink: • Horizontal Linear • Vertical Linear
EB/NO 8.6 Db	Quality of the received signal; Eb/No = Energy per bit/noise power per Hertz; must be greater than 2 dB for operation
MODEM SATELLITE IP 10.61.4.9	External IP address of the VMU; identity of the VMU on the mini-VSAT Broadband network (10.61.4.0 - 10.61.7.255)
MODEM LAN IP 192.168.0.1	Local IP address of the VMU on the vessel's LAN

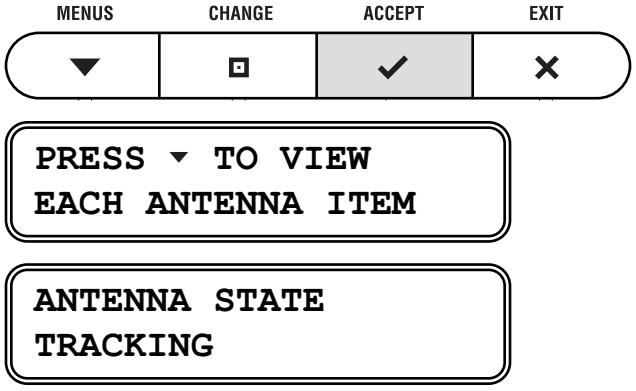
Status Message	Description
MODEM SUBNET MASK 255.255.255.0	Subnet mask of the vessel's LAN that is connected to the VMU
MODEM DHCP STATUS ENABLED	Status of the VMU's DHCP server: • Enabled - VMU is assigning IP addresses to clients on the LAN • Disabled - IP addresses must be assigned manually to each client on the LAN
MODEM TEMPERATURE 50C	Temperature of the VMU chassis
MODEM SERIAL # 4.9	VMU serial number
MODEM SW VERSION r12_34	VMU software version

Antenna Status Information

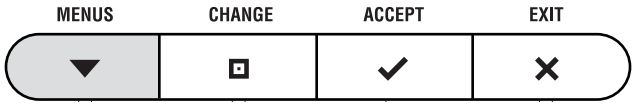
1. Press ▼MENUS until the display shows “ANTENNA STATUS.”



2. Press ✓ACCEPT to start viewing the antenna status screens.



3. Press ▼MENUS to scroll forward through the status messages.
   Press ⊡CHANGE to scroll backward. When you are done reviewing status messages, press ×EXIT.



Antenna Status Messages

The table below lists all of the status messages.

Status Message	Description
ANTENNA STATE TRACKING	General status of the ADU: • Tracking • Searching • Initializing • Waiting for Modem • Cable Unwrap - Unwrapping the internal cable; the cable can wrap up to 720° • Idle • Error
CURRENT SATELLITE 72.5W	Satellite the ADU is currently tracking
AZ/EL TO SATELLITE AZ:234.5, EL:67.2	Azimuth and elevation to the service satellite, relative to the ADU's "Forward" arrow (bow)
SATELLITE SKEW -78.4	LNB skew angle required to receive linear satellite signals
GPS STATUS 41.2N, 123.5W *Note: Not for navigational use!*	Status of the ADU's GPS: • Position data - Latitude/longitude reported by the GPS • Acquiring • Comm Failure
RF HAZARD ZONE 1 335-025	Current setting for RF hazard zone #1
RF HAZARD ZONE 2 225-265	Current setting for RF hazard zone #2
XMT IN ZONES NO	Current setting for XMT in Zones: • No - Transmission is inhibited if ADU points within a zone • Yes - Transmission unrestricted

Status Message	Description
ANTENNA DC INPUT 41.2 VDC	DC voltage measured at the ADU's circuit board
CTRL UNIT DC INPUT 13.4 VDC	DC voltage measured at the ACU's power input
BUC POWER ON 18.4 VDC	Status of the ADU's BUC (transmit) power: • On - BUC power is applied; also reports actual measured power • Off - BUC power is disabled
ANTENNA MODEL TRACPHONE V7	ADU model
ANTENNA SERIAL # 070901234	ADU serial number
ANTENNA MAIN BOARD SW VERSION 2.34	Main software version
ANTENNA RF BOARD SW VERSION 1.23	RF software version
ANTENNA AZ/EL MOTOR SW VERSION 1.28	Azimuth/elevation motor software version
ANTENNA SKEW MOTOR SW VERSION 1.04	Skew motor software version
CTRL UNIT SERIAL # 070902147	ACU serial number
CTRL UNIT SW VERSION 2.14	ACU software version

Calibrating the ADU Gyros

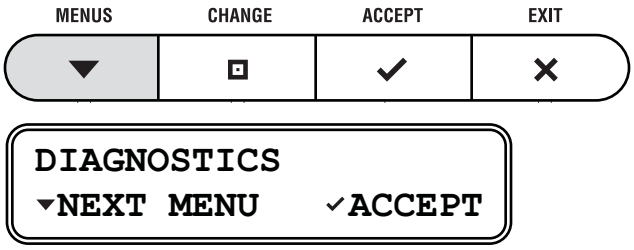
The SAILOR 700 VSAT ADU's gyros continuously measure the motion of your vessel and send this data to the ADU's motor control circuitry to keep the ADU pointed at the satellite. At the factory, each ADU gyro is precisely calibrated to work with the ADU's circuit board. Therefore, if you ever have a gyro or circuit board replaced, you will need to recalibrate the gyros for the new part.

IMPORTANT!

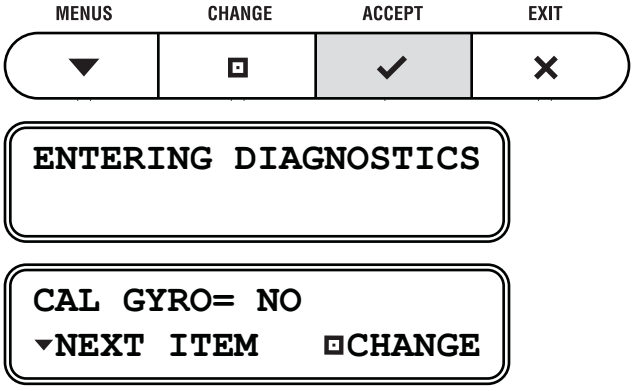
Calibrate the gyros only if directed by Thrane & Thrane Technical Support, and only while the vessel is stationary. A poor gyro calibration can reduce the performance of the ADU.

Follow the steps below to calibrate the gyros.

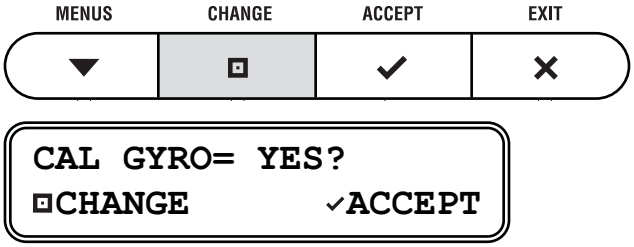
1. Press ▼MENUS until the display shows "DIAGNOSTICS."



2. Press ✓ACCEPT to enter the Diagnostics menu.



3. Press ⊡CHANGE until the display shows "CAL GYRO= YES."



4. Press ✓ACCEPT to start gyro calibration.

```
DO NOT MOVE VESSEL
DURING CALIBRATION
```

```
CALIBRATING GYROS
AZ:    EL:    SKEW:
```

5. Verify that the azimuth (AZ), elevation (EL), and skew gyros all pass (“P”). If any gyro fails (“F”), retry the calibration. If it continues to fail, please seek technical support (see ***“Technical Support” on page 66***).

```
CALIBRATING GYROS
AZ:P   EL:P   SKEW:P
```

6. Once the gyros are calibrated, the ADU restarts. Wait five minutes for system startup.

Technical Support

The SAILOR 700 VSAT system is a sophisticated electronic device; only specially trained Thrane & Thrane-authorized technicians have the tools and expertise necessary to diagnose and repair a system fault. Therefore, if you experience an operating problem or require technical assistance, please call or visit your local authorized SAILOR 700 VSAT dealer or distributor. You can find a distributor near you by visiting ***www.thrane.com/contact/distributors.aspx***.

Please have your system serial numbers handy before you call. You can get these serial numbers from the ACU's Modem Status and Antenna Status menus.

Appendix A
Wiring Diagram

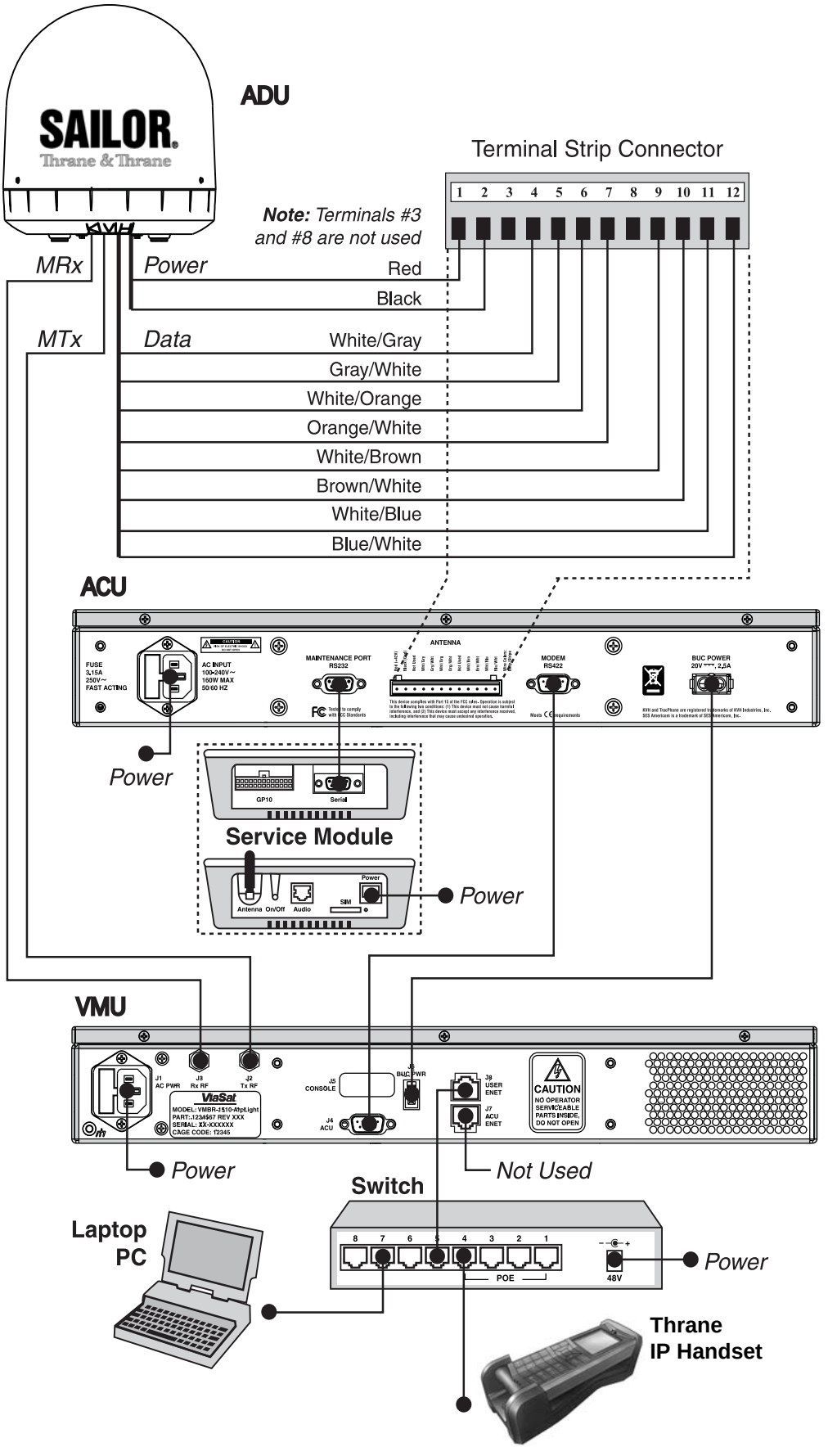
This appendix provides a system wiring diagram. For detailed installation instructions, refer to the Installation Guide.

Contents

Wiring Diagram 69

A

Wiring Diagram



Appendix B
Menus Quick Reference Guide

This appendix provides a quick reference guide to the ACU menus.

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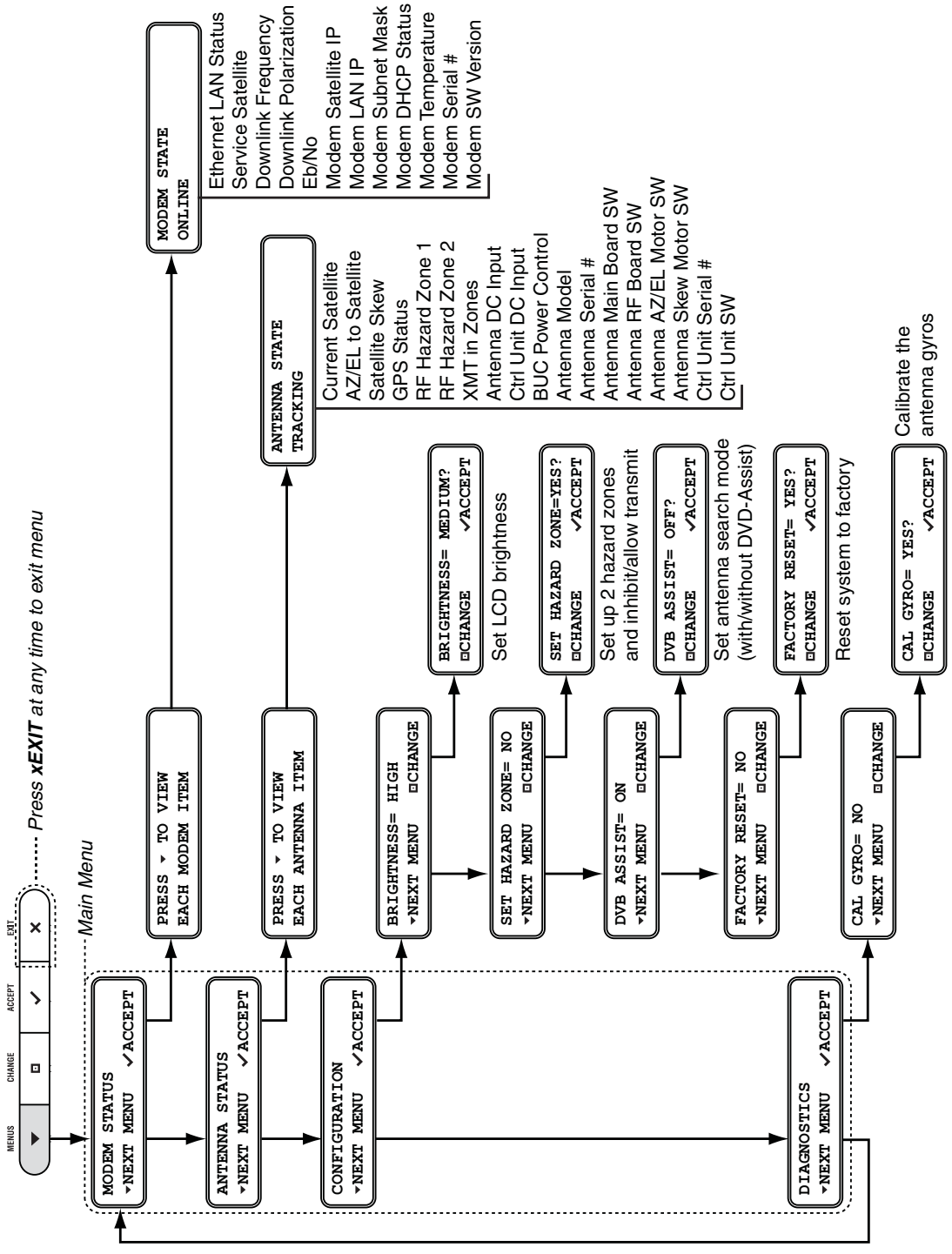
Menus Quick Reference Guide.....75

B

Menus Quick Reference Guide



Appendix C Glossary

This appendix provides a glossary of technical terms used throughout this manual.

Contents

Glossary 77

Glossary

10BaseT

Ethernet standard using twisted pair cabling (such as CAT5). Supports a maximum data rate of 10 Mbps.

100BaseT

Fast Ethernet standard using twisted pair cabling (such as CAT5). Supports a maximum data rate of 100 Mbps.

802.11

Wireless network communications standard commonly used in LANs.

AC

Alternating Current.

ACU

Antenna Control Unit.

ADU

Above Deck Unit. Used for equipment placed above deck, in this case the antenna.

AGC

Automatic Gain Control. Function that automatically boosts the gain of a received signal, as required, to maintain a constant output level. Indicates RF level.

Analog Phone

Standard telephone, also referred to as POTS (Plain Old Telephone Service). Voice signals are converted into electrical pulses by modulating a carrier signal.

AZ

Azimuth angle. Horizontal direction (0°-360°) in which the ADU points.

BUC

Block Up-Converter. Device that converts the intermediate frequency signal from the VMU to a Ku-band frequency and amplifies it for transmission.

Bulletin Board

Communications from the hub to all terminals within its network.

CAT5

Category of twisted pair cable with a maximum data rate of 1,000 Mbps.

Chassis

The outside enclosure of an electronic device.

Crossover Cable

Cable in which the pins are reversed from one end to the other. Used for connecting two computers back-to-back without using an Ethernet hub.

Data Rate

Speed at which a communications path can transfer information, normally measured in bits per second (bps).

bps

Bits per second.

dB

Decibel. Ratio of one power level to another.

DC

Direct Current.

DHCP

Dynamic Host Configuration Protocol. IP protocol that allows a server to automatically assign IP addressing information to a networked computer or device.

DNS

Domain Name Service. IP service that translates domain names (such as “www.thrane.com”) into IP addresses (such as “194.30.189.189”).

Downlink

Communication path from the satellite to the ADU.

DVB

Digital Video Broadcasting project. Global standard of digital broadcasts.

Eb/No

Ratio of Energy-per-bit to Noise power spectral density. The signal-to-noise ratio of a digital signal.

EIRP

Effective Isotropic Radiated Power, measured in dBW.

EL

Elevation angle. Vertical direction (5°-80°) in which the ADU points.

Encryption

As it applies to WiFi, encoding of a wireless signal to protect it from unauthorized reception.

Ethernet

Network communications standard adopted by most LANs. Communicates via twisted pair cable at one of three maximum data rates: (1) Standard - 10 Mbps, (2) Fast - 100 Mbps, and (3) Gigabit - 1 Gbps (1,000 Mbps).

Firewall

Security mechanism that protects a network from unauthorized access.

Footprint

Coverage area of a satellite.

Forward Link

Communication path from the satellite hub to the user terminal. Another term for "Downlink."

Frequency

Number of cycles per second of a radio wave, measured in Hertz (Hz).

GPRS

General Packet Radio Service. High-speed wireless data communications standard.

GPS

Global Positioning System. Network of satellites that allow anyone with a GPS device to accurately fix their position on Earth.

Gyro

A device that precisely senses and measures motion in a single axis, such as elevation or azimuth.

Host

Any computer connected to a network.

HTTP

HyperText Transfer Protocol. The primary protocol for the World Wide Web.

Hub

Earth station that links the satellite network to the terrestrial network.

IF

Intermediate Frequency. As it applies to SAILOR 700 VSAT, L-band output of an LNB, or input to a BUC.

Internet

Global network connecting a vast number of networks and computers.

IP Address

Unique network identifier assigned to a single computer or device on a network. Consists of four eight-bit numbers, each between 0 and 255 (for example, “195.172.7.2”).

Kbps

Kilobits (1,000 bits) per second.

Ku-band

Range of frequencies from 12 GHz to 18 GHz.

LAN

Local Area Network. A relatively small group of computers and devices linked together within close proximity to each other and usually on the same IP network.

L-band

Range of frequencies from 950 MHz to 2150 MHz.

LNB

Low Noise Block down-converter. Device that converts and amplifies a Ku-band satellite signal into an intermediate frequency (IF) L-band signal.

MAC Address

Media Access Control Address. Unique six-byte hardware identifier assigned to every network interface card (NIC). Used in most LAN configurations to ensure the correct addressing of data to specific hosts.

Mbps

Megabits (1,000,000 bits) per second.

Modem

Modulator-demodulator. Translates digital signals into analog signals and vice-versa.

Network

A group of computers and devices (such as printers) linked together.

Network Operations Center (NOC)

Station that maintains and manages a telecommunications network.

NIC

Network Interface Card. Expansion or built-in circuit card that provides a computer with network communication capabilities.

OEM

Original Equipment Manufacturer. Used when a company licenses products or components from another company and sells the products or components with the purchasing company's name or logo on them.

Packet

Part of a data message transmitted over a network. Also contains the address of the destination for routing purposes. *(Data messages are divided into packets, sent over a network, then reassembled in the correct order at the destination.)*

PCI

Peripheral Component Interconnect. Bus standard that supports high-speed connections between computers and peripheral devices.

PCMCIA

Personal Computer Memory Card International Association. Organization that establishes standards for PC cards, credit card-sized memory or input/output devices, primarily used in laptops.

Ping

Software utility used to check a network connection. Sends a test packet to the designated address and reports how long it takes to receive a response.

Polarization

Orientation of a satellite signal. Circular polarization, which has a “corkscrew” propagation path, consists of left-hand (LHCP) and right-hand (RHCP) signals. Linear polarization consists of vertical and horizontal signals offset by 90 degrees.

Protocol

Standard that establishes strict rules for how data is communicated over a network.

Return Link

Communication path from the ADU to the satellite. Another term for “Uplink.”

RF

Radio Frequency.

RJ45

Registered Jack 45. Eight-wire network cable connector for LANs. Similar to a telephone jack.

Router

Device that connects multiple IP networks. For each data packet it receives that is destined for another IP network, determines the best path to reach its destination.

RSSI

Receive Signal Strength Indicator. Indicates the strength of the received satellite signal. The VMU supplies this data to the ACU for tracking purposes.

Rx

Receive.

Skew

Adjustment angle to orient an LNB with a linearly polarized satellite signal.

Spread Spectrum

A type of communication method by which the information signal energy is spread over a frequency band much wider than the minimum bandwidth required for transmitting the information.

SSID

Service Set Identifier. Unique identifier shared by all computers and devices on a single wireless network.

Straight-through Cable

Cable in which the pins at one end match the pins at the other end.

Subnet

Subdivision of a network based on IP address. For example, with a subnet mask of "255.255.255.0," all computers and devices assigned an IP address starting with "195.172.8" belong to one subnet (there are 255 possible). An IP address starting with "195.172.9" designates a different subnet.

Subnet Mask

Divides the latter portion of an IP address into subnet and host designations. For example, in a regular class B network, the first two numbers in an IP address define the network ID while the last two numbers define the host ID (the individual computer or device on that network). A subnet mask changes the format of these last two numbers by designating the third number as the subnet ID and designating the last number as the host ID (the computer or device *within that subnet*).

SW

Software.

Switch

Device that connects two segments of a LAN. Routes data from one segment to another based on the MAC address of the destination.

TBD

To Be Defined

TCP/IP

Transmission Control Protocol/Internet Protocol. Two communications protocols for the Internet. IP handles the delivery of data packets over the Internet; TCP ensures that all data packets are successfully delivered and assembled in the proper order.

Twisted Pair

Cable type consisting of multiple pairs of cable in which two wires are spiraled together to reduce electromagnetic noise. Can be either shielded (STP) or unshielded (UTP). Used extensively in LANs and telephone networks.

Tx

Transmit.

URL

Uniform Resource Locator. Address of a web page or file on the World Wide Web. Consists of three parts: (1) protocol (such as “http”), (2) IP address or domain name (such as “www.thrane.com”), and (3) name of the web page or file to be retrieved from that address (such as “index.html”).

USB

Universal Serial Bus. Bus standard for connecting peripheral devices to a computer. Supports a data rate of 12 Mbps.

UTP

Unshielded Twisted Pair. Cable consisting of four twisted pairs (8 wires), usually terminated by RJ45 connectors. Commonly used in LANs.

VMU

VSAT Modem Unit. The modem unit performing the "translation" of voice or data signals into signals that can be transmitted over satellite.

VoIP

Voice over Internet Protocol. Allows telephone conversations to be routed via the Internet.

VSAT

Very Small Aperture (< 3m) Terminal. Communications system in which multiple users connect via satellite to a single land-based hub, which handles the routing of all network traffic.

WAN

Wide Area Network. A group of computers, devices, and possibly LANs, linked together over a large geographic area.

WAP

Wireless Network Access Point. Device that links computers wirelessly to a LAN. To communicate with the WAP, each computer needs a properly configured wireless network card.

WEP

Wired Equivalent Privacy. Security mechanism for wireless networks. Encrypts data to protect it from unauthorized interception.

WiFi

Wireless Fidelity. Refers to an 802.11 wireless network.

WINS Resolution

Windows Internet Naming Service Resolution. Organizes the names of all Windows computers in a network with their respective IP addresses. Similar function to DNS.

Wireless Network Card

PCI or PCMCIA card that provides a computer with wireless access to a LAN via a WAP.

Xponder

Transponder. Component of a satellite that receives radio transmissions from Earth, amplifies them, and retransmits them back to Earth on a different frequency.

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